

Smart Sensors (with Ultra-High-Speed CCD Camera)

ZFV Series

CSM_ZFV_DS_E_1_1

Low-cost but advanced Smart Sensors combining benefits of optical and vision sensors.

- Sensor integrated with light for easy installation
- Easy operation by selecting icons while watching LCD monitor
- Ultra-high speed response for fast-moving production lines



Ordering Information

■ Sets of Sensor Head and Amplifier Unit


Type	NPN	PNP
Narrow View/Single Function	ZFV-R1010	ZFV-R1015
Narrow View/Standard	ZFV-R1020	ZFV-R1025
Wide View/Single Function	ZFV-R5010	ZFV-R5015
Wide View/Standard	ZFV-R5020	ZFV-R5025

■ Sensor Heads

Appearance	Type	Working length	Sensing area	Model
	Narrow View	34 to 49 mm (variable)	5 × 4.6 mm (H × V) to 9 × 8.3 mm (H × V)	ZFV-SR10 ZFV-SR10R *
	Wide View	38 to 194 mm (variable)	10 × 9.2 mm (H × V) to 50 × 46 mm (H × V)	ZFV-SR50 ZFV-SR50R *

* Robot Cable type.

■ Amplifier Units


Appearance	Type	Power supply	Output type	Model
	Single Function	24 VDC ± 10%	NPN	ZFV-A10
	Standard		PNP	ZFV-A15
			NPN	ZFV-A20
			PNP	ZFV-A25

■ Accessories (Order Separately)


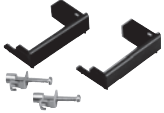
Data Storage Units

Appearance	Power supply	Output type	Model
	24 VDC	NPN	ZS-DSU11
		PNP	ZS-DSU41

Controller Link Unit

Appearance	Model
	ZS-XCN

Panel-mounting Adapter

Appearance	Model	
	ZS-XPM1	First Unit
	ZS-XPM2	Additional Units (for expansion)

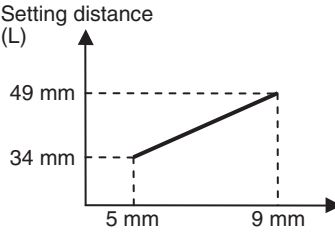
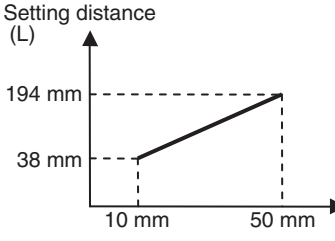
Sensor Head Extension Cable

Cable length	Model
3 m	ZFV-XC3BV2
	ZFV-XC3BRV2 (Robot cable type)
8 m	ZFV-XC8BV2

Note: A maximum of two Extension Cables can be connected to extend the cable length of each Sensor Head. There are no restrictions on the combinations of the two Extension Cables to be used.

Specifications

■ Sensor Heads

Item	ZFV-SR10	ZFV-SR10R	ZFV-SR50	ZFV-SR50R
Setting distance (L)	34 to 49 mm		38 to 194 mm	
Detection range (H × V)	5 × 4.6 mm to 9 × 8.3 mm		10 × 9.2 mm to 50 × 46 mm	
Relation between setting distance and detection range				
Guide light	Provided (center, sensing area)			
Built-in lens	Focus: f15.65		Focus: f13.47	
Object lighting method	Pulse lighting			
Object light source	Eight red LEDs			
Sensing element	1/3-inch CCD, partial scan			
Shutter	Electronic shutter, shutter time: 1/1,000 to 1/4,000			
Power supply voltage	15 VDC (Supplied from Amplifier Unit.)			
Current consumption	Approx. 200 mA			
Dielectric strength	1,000 VAC, 50/60 Hz for 1 min			
Vibration resistance (destruction)	10 to 150 Hz, 0.35-mm single amplitude, 10 times each in X, Y, and Z directions for 8 min			
Shock resistance (destruction)	150 m/s ² , three times each in six directions (up/down, left/right, forward/backward)			
Ambient temperature	Operating: 0 to 40°C, Storage: −25 to 65°C (with no icing or condensation)			
Ambient humidity	Operating and storage: 35% to 85% (with no condensation)			
Ambient atmosphere	Must be free of corrosive gas.			
Connection method	Pre-wired cord			
Cable length	Standard cable (Available length: 2 m)	Robot cable (Available length: 2 m)	Standard cable (Available lengths: 2 m, 5 m)	Robot cable (Available length: 2 m)
Degree of protection	IEC60529, IP65			
Materials (Case)	ABS			
Materials (Mounting fixture)	PBT	Base: Aluminum, bracket: Stainless steel	PBT	Base: Aluminum, bracket: Stainless steel
Weight (including mounting fixture and cord)	Approx. 200 g	Approx. 270 g	2-m-long cord: Approx. 200 g 5-m-long cord: Approx. 350 g	Approx. 270 g
Accessories	ZFV-XMF mounting fixture (1), Ferrite core (1), Instruction guide (1)	ZFV-XMF3 mounting fixture (1), Ferrite core (1), Instruction guide (1)	ZFV-XMF mounting fixture (1), Ferrite core (1 (2 for 5-m-cord models)), Instructionguide (1)	ZFV-XMF3 mounting fixture (1), Ferrite core (1), Instruction guide (1)

■ Amplifier Units

Item		Single-function models		Standard models	
		ZFV-A10	ZFV-A15	ZFV-A20	ZFV-A25
Output method		NPN	PNP	NPN	PNP
Output		NPN: NPN open-collector output, 50 mA max. at 30 VDC, Residual voltage: 1.2 V max. PNP: PNP open-collector output, 50 mA max., Residual voltage: 1.2 V max.			
Inspection items		Pattern (PTRN), Brightness (BRGT)		Patterns (PTRN), Brightness (BRGT), Area (AREA), Width (WID), Position (POSI), Count (CNT), Characters (CHAR)	
Teaching area		Rectangular, one area			
Teaching area size		• Pattern (PTRN), Brightness (BRGT): Any rectangular area (256 × 256 max.) • Area (AREA), Width (WID), Position (POSI), Count (CNT), Characters (CHAR): Any rectangular area (full screen max.)			
Sensing area		Full screen			
Resolution		468 × 432 (H × V) max.			
Bank selection		Supported for 8 banks.			
Response time		Pattern (PTRN), Brightness (BRGT): High-speed: 4 ms, Standard: 8 ms, High-precision: 12 ms (not using partial scan) Area (AREA), Width (WID), Position (POSI), Count (CNT), Characters (CHAR): 128 × 128: 15 ms max.			
Other functions		Control output switching: ON for OK or ON for NG ON delay/OFF delay, One-shot output, “ECO” mode			
Output signals		(1) Control output (OUTPUT), (2) Enable output (ENABLE), (3) Error output (ERROR)			
Input signals		(1) Simultaneous measurement input (TRIG) or Continuous measurement input (TRIG), Switched by using menu. (2) Bank selection inputs (BANK1 to BANK3) (3) Workpiece still teaching (TEACH) or Workpiece moving teaching (TEACH), Switched by using menu.			
Connect- ing to ZS- DSU	Image log- ging trigger	Stores NG images or all images.			
	Sampling rate	ZFV measurement cycle (See note 1.)			
	Number of logged im- age	Logs up to 128 images in series			
	Number of connected	15 max. (ZFV: 5 Units max., ZS-LDC: 9 Units max., ZS-MDC (See note 2.): 1 Unit max.)			
	External bank func- tion	Amplifier Unit setting data can be saved to the memory card as bank data. Reading bank data enables bank switching.			
Sensor Head interface		Digital interface			
Image display		Compact TFT 2.2-inch LCD (Display dots: 930 × 234)			
Indicators		• Judgement result indicator (OUTPUT) • Inspection mode indicator (RUN)			
Operation interface		• Cursor keys (up, down, left, right) • Setting key (SET) • Escape key (ESC) • Operating mode switching (slide switch) • Menu switching (slide switch) • Teaching/Display switching key (TEACH/VIEW)			
Power supply voltage		20.4 to 26.4 VDC (including ripple)			
Current consumption		600 mA max. (with Sensor Head connected, power supply voltage 24VDC)			
Dielectric strength		1,000 VAC, 50/60 Hz for 1 min between leads and Amplifier Unit case			
Noise immunity		1 kV, Pulse rise: 5 ns, Pulse width: 50 ns, Burst duration: 15 ms, Cycle: 300 ms			
Vibration resistance		Destruction: 10 to 150 Hz, 0.1-mm single amplitude, 10 times each in X, Y, and Z directions for 8 min			
Shock resistance		Destruction: 150 m/s ² , three times each in six directions (up/down, left/right, forward/backward)			
Ambient temperature		Operating: 0 to 50°C Storage: -25 to 65°C (with no icing or condensation)			
Ambient humidity		Operating and storage: 35% to 85%			
Connection method		Prewired, Standard cable length: 2 m			
Ambient atmosphere		Must be free of corrosive gas.			
Degree of protection		IEC60529, IP20			
Materials		Polycarbonate			
Weight		Approx. 300 g (including cord)			
Accessories		Ferrite core (1), Instruction sheet			

Note 1. This is the sampling rate when logging images. To log measurement data only, use the ZS-DSU settings.

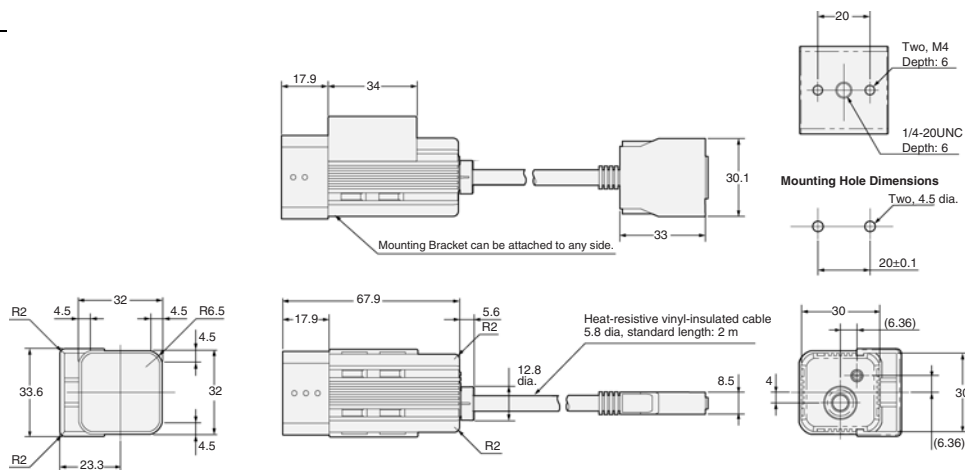
2. Image logging is not possible when the ZS-MDC is connected.

Dimensions

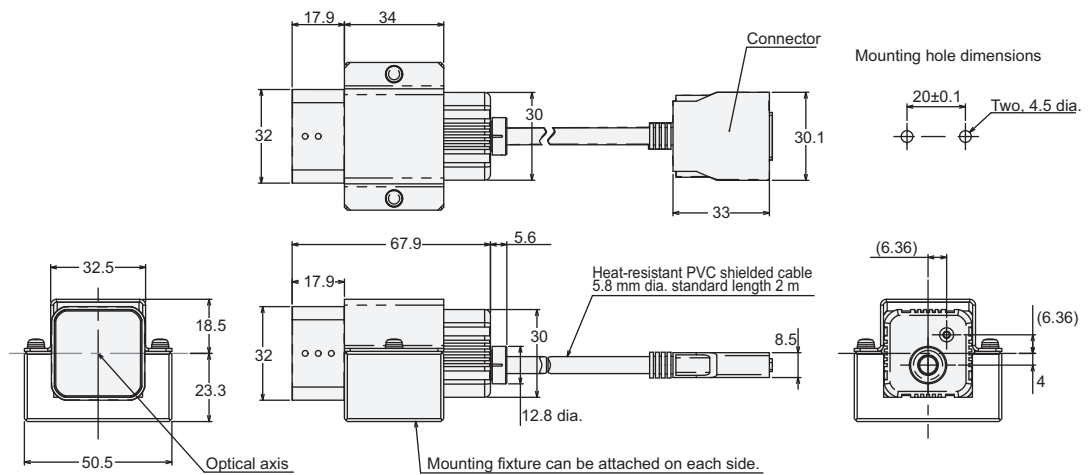
Note: All units are in millimeters unless otherwise indicated.

Sensor Heads

ZFV-SR□

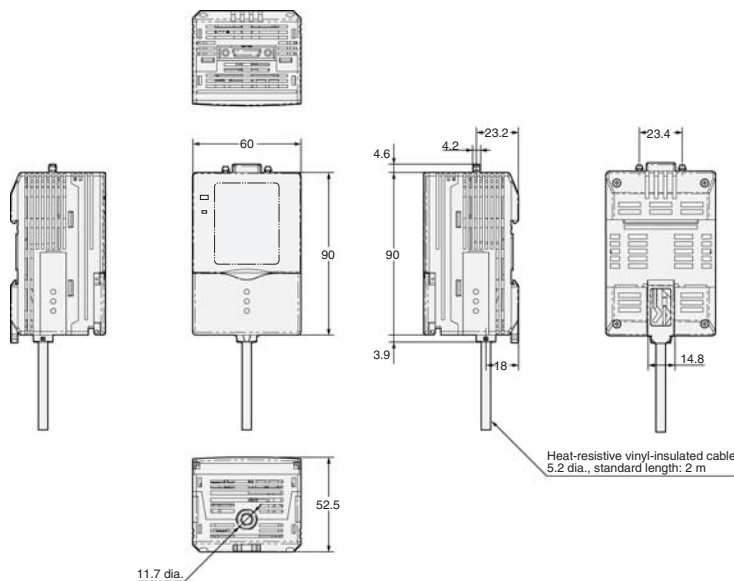


ZFV-SR10R/SR50R



Amplifier Units

ZFV-A□



Terms and Conditions Agreement

Read and understand this catalog.

Please read and understand this catalog before purchasing the products. Please consult your OMRON representative if you have any questions or comments.

Warranties.

(a) Exclusive Warranty. Omron's exclusive warranty is that the Products will be free from defects in materials and workmanship for a period of twelve months from the date of sale by Omron (or such other period expressed in writing by Omron). Omron disclaims all other warranties, express or implied.

(b) Limitations. OMRON MAKES NO WARRANTY OR REPRESENTATION, EXPRESS OR IMPLIED, ABOUT NON-INFRINGEMENT, MERCHANTABILITY OR FITNESS FOR A PARTICULAR PURPOSE OF THE PRODUCTS. BUYER ACKNOWLEDGES THAT IT ALONE HAS DETERMINED THAT THE PRODUCTS WILL SUITABLY MEET THE REQUIREMENTS OF THEIR INTENDED USE.

Omron further disclaims all warranties and responsibility of any type for claims or expenses based on infringement by the Products or otherwise of any intellectual property right. (c) Buyer Remedy. Omron's sole obligation hereunder shall be, at Omron's election, to (i) replace (in the form originally shipped with Buyer responsible for labor charges for removal or replacement thereof) the non-complying Product, (ii) repair the non-complying Product, or (iii) repay or credit Buyer an amount equal to the purchase price of the non-complying Product; provided that in no event shall Omron be responsible for warranty, repair, indemnity or any other claims or expenses regarding the Products unless Omron's analysis confirms that the Products were properly handled, stored, installed and maintained and not subject to contamination, abuse, misuse or inappropriate modification. Return of any Products by Buyer must be approved in writing by Omron before shipment. Omron Companies shall not be liable for the suitability or unsuitability or the results from the use of Products in combination with any electrical or electronic components, circuits, system assemblies or any other materials or substances or environments. Any advice, recommendations or information given orally or in writing, are not to be construed as an amendment or addition to the above warranty.

See <http://www.omron.com/global/> or contact your Omron representative for published information.

Limitation on Liability; Etc.

OMRON COMPANIES SHALL NOT BE LIABLE FOR SPECIAL, INDIRECT, INCIDENTAL, OR CONSEQUENTIAL DAMAGES, LOSS OF PROFITS OR PRODUCTION OR COMMERCIAL LOSS IN ANY WAY CONNECTED WITH THE PRODUCTS, WHETHER SUCH CLAIM IS BASED IN CONTRACT, WARRANTY, NEGLIGENCE OR STRICT LIABILITY.

Further, in no event shall liability of Omron Companies exceed the individual price of the Product on which liability is asserted.

Suitability of Use.

Omron Companies shall not be responsible for conformity with any standards, codes or regulations which apply to the combination of the Product in the Buyer's application or use of the Product. At Buyer's request, Omron will provide applicable third party certification documents identifying ratings and limitations of use which apply to the Product. This information by itself is not sufficient for a complete determination of the suitability of the Product in combination with the end product, machine, system, or other application or use. Buyer shall be solely responsible for determining appropriateness of the particular Product with respect to Buyer's application, product or system. Buyer shall take application responsibility in all cases.

NEVER USE THE PRODUCT FOR AN APPLICATION INVOLVING SERIOUS RISK TO LIFE OR PROPERTY OR IN LARGE QUANTITIES WITHOUT ENSURING THAT THE SYSTEM AS A WHOLE HAS BEEN DESIGNED TO ADDRESS THE RISKS, AND THAT THE OMRON PRODUCT(S) IS PROPERLY RATED AND INSTALLED FOR THE INTENDED USE WITHIN THE OVERALL EQUIPMENT OR SYSTEM.

Programmable Products.

Omron Companies shall not be responsible for the user's programming of a programmable Product, or any consequence thereof.

Performance Data.

Data presented in Omron Company websites, catalogs and other materials is provided as a guide for the user in determining suitability and does not constitute a warranty. It may represent the result of Omron's test conditions, and the user must correlate it to actual application requirements. Actual performance is subject to the Omron's Warranty and Limitations of Liability.

Change in Specifications.

Product specifications and accessories may be changed at any time based on improvements and other reasons. It is our practice to change part numbers when published ratings or features are changed, or when significant construction changes are made. However, some specifications of the Product may be changed without any notice. When in doubt, special part numbers may be assigned to fix or establish key specifications for your application. Please consult with your Omron's representative at any time to confirm actual specifications of purchased Product.

Errors and Omissions.

Information presented by Omron Companies has been checked and is believed to be accurate; however, no responsibility is assumed for clerical, typographical or proofreading errors or omissions.

Mouser Electronics

Authorized Distributor

Click to View Pricing, Inventory, Delivery & Lifecycle Information:

Omron:

[ZFV-R5015](#) [ZS-XPM1](#) [ZS-XPM2](#) [ZFV-R5010](#) [ZFV-A20](#) [ZFV-R1015](#) [ZFV-SR10](#) [ZFV-R1025](#) [ZFV-A25](#) [ZFV-A15](#)
[ZFV-R5020](#) [ZFV-R1020](#) [ZFV-R1010](#) [ZFV-SR50](#) [ZFV-A10](#) [ZFV-R5025](#)