Smart Sensors with Ultra-High-Speed Color CCD Cameras

ZFV-C

Simple to use.
Detection abilities close to human vision.

- One-touch automatic setting for stable detection
- 2.2-inch monitor integrated in compact housing
- Sensor Heads with field of view up to 150 mm

Ordering Information

Models
Sensor Heads

<table>
<thead>
<tr>
<th>Appearance</th>
<th>Type</th>
<th>Setting distance</th>
<th>Sensing area</th>
<th>Degree of protection</th>
<th>Model</th>
</tr>
</thead>
<tbody>
<tr>
<td>Narrow View</td>
<td>34 to 49 mm (variable)</td>
<td>5 × 4.6 mm to 9 × 8.3 mm (variable)</td>
<td>IP65</td>
<td>ZFV-SC10</td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td>ZFV-SC10R</td>
</tr>
<tr>
<td>Standard</td>
<td>31 to 187 mm (variable)</td>
<td>10 × 9.2 mm to 50 × 46 mm (variable)</td>
<td>IP65</td>
<td>ZFV-SC50</td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td>ZFV-SC50R</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td></td>
<td>IP67</td>
<td>ZFV-SC50W</td>
</tr>
<tr>
<td>Wide View</td>
<td>66 to 141 mm (variable)</td>
<td>50 × 46 mm (H × V) to 90 × 83 mm (H × V)</td>
<td>IP65</td>
<td>ZFV-SC90</td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td>ZFV-SC90R</td>
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<tr>
<td></td>
<td></td>
<td></td>
<td></td>
<td>IP67</td>
<td>ZFV-SC90W</td>
</tr>
<tr>
<td>Ultra-wide View</td>
<td>114 to 226 mm (variable)</td>
<td>90 × 83 mm (H × V) to 150 × 138 mm (H × V)</td>
<td>IP65</td>
<td>ZFV-SC150</td>
<td></td>
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<td></td>
<td></td>
<td>ZFV-SC150R</td>
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<td></td>
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<td></td>
<td></td>
<td>IP67</td>
<td>ZFV-SC150W</td>
</tr>
</tbody>
</table>

* Robot Cable type.

Amplifier Units

<table>
<thead>
<tr>
<th>Appearance</th>
<th>Type</th>
<th>Power supply</th>
<th>Output type</th>
<th>Model</th>
</tr>
</thead>
<tbody>
<tr>
<td>Single-function</td>
<td>Amplifier Unit</td>
<td>24 VDC</td>
<td>NPN</td>
<td>ZFV-CA40</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td>PNP</td>
<td>ZFV-CA45</td>
</tr>
<tr>
<td>Multifunction</td>
<td>Amplifier Unit</td>
<td></td>
<td>NPN</td>
<td>ZFV-CA50</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td>PNP</td>
<td>ZFV-CA55</td>
</tr>
</tbody>
</table>
**Accessories**

**Data Storage Units**

<table>
<thead>
<tr>
<th>Appearance</th>
<th>Power supply</th>
<th>Output type</th>
<th>Model</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>24 VDC</td>
<td>NPN</td>
<td>ZS-DSU11</td>
</tr>
<tr>
<td></td>
<td></td>
<td>PNP</td>
<td>ZS-DSU41</td>
</tr>
</tbody>
</table>

**Controller Link Unit**

<table>
<thead>
<tr>
<th>Appearance</th>
<th>Model</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>ZS-XCN</td>
</tr>
</tbody>
</table>

**Sensor Head Extension Cable**

<table>
<thead>
<tr>
<th>Cable length</th>
<th>Model</th>
<th>Notes</th>
</tr>
</thead>
<tbody>
<tr>
<td>3 m</td>
<td>ZFV-XC3BV2</td>
<td></td>
</tr>
<tr>
<td>3 m</td>
<td>ZFV-XC3BRV2 (Robot cable type)</td>
<td></td>
</tr>
<tr>
<td>8 m</td>
<td>ZFV-XC8BV2 ⚫️</td>
<td></td>
</tr>
</tbody>
</table>

*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.*

*The ZFV-XC8BV2 Extension Cable can be used only with ZFV-SC10/SC50/SC50W Sensor Heads.*

**Panel-mounting Adapter**

<table>
<thead>
<tr>
<th>Appearance</th>
<th>Model</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>ZS-XPM1</td>
</tr>
<tr>
<td></td>
<td>ZS-XPM2</td>
</tr>
</tbody>
</table>

**External Lighting**

<table>
<thead>
<tr>
<th>Appearance</th>
<th>Type</th>
<th>Model</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Bar Lighting</td>
<td>ZFV-LTL01</td>
</tr>
<tr>
<td></td>
<td>Bar Double Lighting</td>
<td>ZFV-LTL02</td>
</tr>
<tr>
<td></td>
<td>Bar Low-angle Lighting</td>
<td>ZFV-LTL04</td>
</tr>
<tr>
<td></td>
<td>Light Source for Through-beam Lighting</td>
<td>ZFV-LTF01</td>
</tr>
</tbody>
</table>
### Specifications

#### Sensor Heads

<table>
<thead>
<tr>
<th></th>
<th></th>
<th></th>
<th></th>
<th></th>
<th></th>
<th></th>
<th></th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td>Type</td>
<td>Narrow View Type</td>
<td>Standard Type</td>
<td>Wide View Type</td>
<td>Ultra-wide View Type</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Setting distance (L)</td>
<td>34 to 49 mm (variable)</td>
<td>31 to 187 mm (variable)</td>
<td>67 to 142 mm (variable)</td>
<td>115 to 227 mm (variable)</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Sensing range (H × V)</th>
<th>Setting distance (L)</th>
<th>Sensing range (H)</th>
</tr>
</thead>
<tbody>
<tr>
<td>(V)</td>
<td>5 × 4.6 mm to 9 × 8.3 mm (variable)</td>
<td>10 × 9.2 mm to 50 × 46 mm (variable)</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Relation between setting distance and sensing range</th>
</tr>
</thead>
<tbody>
<tr>
<td><img src="image" alt="Diagram" /></td>
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</tbody>
</table>

<table>
<thead>
<tr>
<th>Built-in lens</th>
<th>Focus: 115.65</th>
<th>Focus: 113.47</th>
<th>Focus: 16.1</th>
</tr>
</thead>
<tbody>
<tr>
<td>Object lighting method</td>
<td>Pulse lighting</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Object light source</td>
<td>Eight white LEDs</td>
<td>Thirty-six white LEDs</td>
<td>Twenty white LEDs</td>
</tr>
<tr>
<td>Optional lighting interface</td>
<td>No</td>
<td>Yes</td>
<td>No</td>
</tr>
<tr>
<td>Sensing element</td>
<td>1/3-inch CCD</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Shutter</td>
<td>Electronic shutter, shutter time: 1/500 to 1/8,000</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Power supply voltage</td>
<td>15 VDC (Supplied from Amplifier Unit.)</td>
<td>15 VDC, 48 VDC (Supplied from Amplifier Unit.)</td>
<td></td>
</tr>
<tr>
<td>Current consumption</td>
<td>Approx. 200 mA</td>
<td>Approx. 350 mA (15 V: approx. 150 mA, 48 V: approx. 200 mA, including current when external light is connected)</td>
<td></td>
</tr>
<tr>
<td>Dielectric strength</td>
<td>1,000 VAC, 50/60 Hz for 1 min</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Vibration resistance (destruction)</td>
<td>10 to 150 Hz, 0.35-mm single amplitude, 10 times each in X, Y, and Z directions for 8 min</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Shock resistance (destruction)</td>
<td>150 m/s², three times each in six directions (up/down, left/right, forward/backward)</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Ambient temperature range</td>
<td>Operating: 0 to 40°C, Storage: -20 to +65°C (with no icing or condensation)</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Ambient humidity range</td>
<td>Operating and storage: 35% to 85% (with no condensation)</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Ambient atmosphere</td>
<td>Must be free of corrosive gas.</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Connection method</td>
<td>Prewired, Standard cable length: 2 m</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Cable length</td>
<td>Standard Cable: 2m</td>
<td>Robot Cable: 2m</td>
<td>Standard Cable: 2m</td>
</tr>
<tr>
<td>Weight (including mounting bracket and cord)</td>
<td>Approx. 200 g</td>
<td>Approx. 270 g</td>
<td>Approx. 270 g</td>
</tr>
<tr>
<td>Accessories</td>
<td>Mounting bracket</td>
<td>ZFV-XMF (1)</td>
<td>ZFV-XMF3 (1)</td>
</tr>
<tr>
<td>Ferrite core</td>
<td>2</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Instruction sheet</td>
<td>1</td>
<td></td>
<td></td>
</tr>
<tr>
<td>LED class</td>
<td>Risk Group 1 (IEC62471)</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>
Amplifier Units

<table>
<thead>
<tr>
<th>Item</th>
<th>ZFV-CA40</th>
<th>ZFV-CA45</th>
<th>ZFV-CA50</th>
<th>ZFV-CA55</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Output method</strong></td>
<td>NPN open collector, 30 VDC 50 mA max., residual voltage 1.2 V max.</td>
<td>PNP open collector, 50 mA max., residual voltage 1.2 V max.</td>
<td>NPN open collector, 30 VDC 50 mA max., residual voltage 1.2 V max.</td>
<td>PNP open collector, 50 mA max., residual voltage 1.2 V max.</td>
</tr>
<tr>
<td><strong>Serial I/O</strong></td>
<td>USB2.0 1 port, full-speed (12 Mbps) MINI-B</td>
<td>RS-232C 1 port, 115200 bps max.</td>
<td></td>
<td></td>
</tr>
<tr>
<td><strong>Number of inspection items that can be executed simultaneously</strong></td>
<td>1 item</td>
<td>8 items max.</td>
<td></td>
<td></td>
</tr>
<tr>
<td><strong>Inspection items</strong></td>
<td>Patterns (PATTERN), Brightness (BRIGHT), Area (AREA), Width (WIDTH), Position (POSITION), Count (COUNT), Color inspection (HUE), Character (CHARA)</td>
<td>Patterns (PATTERN), Brightness (BRIGHT): Any rectangular area (256 X 256 max.)</td>
<td>Patterns (PATTERN), Brightness (BRIGHT): Any rectangular area (256 X 256 max.)</td>
<td>Patterns (PATTERN), Brightness (BRIGHT): Any rectangular area (256 X 256 max.)</td>
</tr>
<tr>
<td><strong>Teaching area</strong></td>
<td>Rectangular, one area</td>
<td>Rectangular, one area</td>
<td>Rectangular, one area</td>
<td>Rectangular, one area</td>
</tr>
<tr>
<td><strong>Teaching area size</strong></td>
<td>• Patterns (PATTERN), Brightness (BRIGHT): Any rectangular area (256 X 256 max.)</td>
<td>• Area (AREA), Width (WIDTH), Position (POSITION), Count (COUNT), Color inspection (HUE), Character (CHARA): Any rectangular area (full screen max.)</td>
<td>• Area (AREA), Width (WIDTH), Position (POSITION), Count (COUNT), Color inspection (HUE), Character (CHARA): Any rectangular area (full screen max.)</td>
<td>• Area (AREA), Width (WIDTH), Position (POSITION), Count (COUNT), Color inspection (HUE), Character (CHARA): Any rectangular area (full screen max.)</td>
</tr>
<tr>
<td><strong>Sensing area</strong></td>
<td>Full screen</td>
<td>Full screen</td>
<td>Full screen</td>
<td>Full screen</td>
</tr>
<tr>
<td><strong>Resolution</strong></td>
<td>486 X 432 (H X V) max.</td>
<td>486 X 432 (H X V) max.</td>
<td>486 X 432 (H X V) max.</td>
<td>486 X 432 (H X V) max.</td>
</tr>
<tr>
<td><strong>Image logging</strong></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td><strong>Logging trigger</strong></td>
<td>Stores NG images or all images (selectable).</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td><strong>Sampling rate</strong></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td><strong>Number of logged images</strong></td>
<td>Logs up to 128 images in series</td>
<td>Logs up to 128 images in series</td>
<td>Logs up to 128 images in series</td>
<td>Logs up to 128 images in series</td>
</tr>
<tr>
<td><strong>Image input cycle</strong></td>
<td>13 ms (Standard), 8 ms (FAST mode), 5 ms (MAX mode)</td>
<td>13 ms (Standard), 8 ms (FAST mode), 5 ms (MAX mode)</td>
<td>13 ms (Standard), 8 ms (FAST mode), 5 ms (MAX mode)</td>
<td>13 ms (Standard), 8 ms (FAST mode), 5 ms (MAX mode)</td>
</tr>
<tr>
<td><strong>Output signals</strong></td>
<td>(1) Control output (OUTPUT) (2) Enable output (ENABLE) (3) Error output (ERROR)</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td><strong>Current consumption</strong></td>
<td>800mA max. (with Sensor Head ZFV-SC10/SC50/SC90 connected, power supply voltage 24VDC)</td>
<td>930mA max. (with Sensor Head ZFV-SC150/Option Lighting Unit ZFV-LTL01/LTL02 connected, power supply voltage 24VDC)</td>
<td>1050mA max. (Option Lighting Unit ZFV-LTL04/LTF01 connected, power supply voltage 24VDC)</td>
<td>1050mA max. (Option Lighting Unit ZFV-LTL04/LTF01 connected, power supply voltage 24VDC)</td>
</tr>
<tr>
<td><strong>Dielectric strength</strong></td>
<td>Operating: 0 to 50°C, Storage: -25 to +65°C (with no icing or condensation)</td>
<td>Operating and storage: 35% to 85% (with no condensation)</td>
<td>Operating and storage: 35% to 85% (with no condensation)</td>
<td>Operating and storage: 35% to 85% (with no condensation)</td>
</tr>
<tr>
<td><strong>Ambient temperature range</strong></td>
<td>Operating: 0 to 50°C, Storage: -25 to +65°C (with no icing or condensation)</td>
<td>Operating and storage: 35% to 85% (with no condensation)</td>
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</tr>
<tr>
<td><strong>Ambient humidity range</strong></td>
<td>Operating: 0 to 50°C, Storage: -25 to +65°C (with no icing or condensation)</td>
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<td>Operating and storage: 35% to 85% (with no condensation)</td>
<td>Operating and storage: 35% to 85% (with no condensation)</td>
</tr>
<tr>
<td><strong>Ambient atmosphere</strong></td>
<td>Must be free of corrosive gas.</td>
<td>Must be free of corrosive gas.</td>
<td>Must be free of corrosive gas.</td>
<td>Must be free of corrosive gas.</td>
</tr>
<tr>
<td><strong>Degree of protection</strong></td>
<td>IEC 60529, IP20</td>
<td>IEC 60529, IP20</td>
<td>IEC 60529, IP20</td>
<td>IEC 60529, IP20</td>
</tr>
<tr>
<td><strong>Materials</strong></td>
<td>Polycarbonate</td>
<td>Polycarbonate</td>
<td>Polycarbonate</td>
<td>Polycarbonate</td>
</tr>
<tr>
<td><strong>Weight</strong></td>
<td>Approx. 300 g (including cord; packaged condition: 450 g)</td>
<td>Approx. 300 g (including cord; packaged condition: 450 g)</td>
<td>Approx. 300 g (including cord; packaged condition: 450 g)</td>
<td>Approx. 300 g (including cord; packaged condition: 450 g)</td>
</tr>
<tr>
<td><strong>Accessories</strong></td>
<td>Ferrite core (1), Instruction sheet</td>
<td>Ferrite core (1), Instruction sheet</td>
<td>Ferrite core (1), Instruction sheet</td>
<td>Ferrite core (1), Instruction sheet</td>
</tr>
</tbody>
</table>

*1 A ZS-DSU Data Storage Unit is required. There are restrictions in the versions of Units that can be connected. Ask your OMRON representative for details.

*2 If there is only one inspection item, the measurement mode can be switched to Single Bank Mode to increase the number of models that can be registered to eight for the Amplifier Unit and 128 for the external bank.
Dimensions

Sensor Heads

ZFV-SC10

ZFV-SC10R

ZFV-SC50/SC50W
ZFV-SC50R

Mounting Bracket can be attached to any side.

Heat-resistive vinyl-insulated cable 6.2 dia, standard length: 2 m

Mounting Hole Dimensions
- Two, 4.5 dia.
- 20x0.1

External lighting output

Focus adjustment dial

ZFV-SC90/SC90W

Mounting Bracket can be attached to any side.

Heat-resistive vinyl-insulated cable 6.2 dia, standard length: 2 m

Mounting Hole Dimensions
- Two, 4.5 dia.
- Two, M4 Depth: 6
- 1/4-20UNC Depth: 6
- 20±0.1

External lighting output

Focus adjustment dial

ZFV-SC90R

Mounting Bracket can be attached to any side.

Heat-resistive vinyl-insulated cable 6.2 dia, standard length: 2 m

Mounting Hole Dimensions
- Two, 4.5 dia.
- 20x0.1

External lighting output

Focus adjustment dial
Amplifier Units
ZFV-CA

Optional Lighting
ZFV-LTL01
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