SONY®

B/W Video Camera Module
XC-E Series

The XC-E Series are compact, light-weight one-piece black and white cameras incorporating the latest 1/2 and 1/3 type Interline (IT) CCD which produces new levels of picture detail. With dimensions of 29 x 29 x 30 mm*, these cameras can easily be installed in places where installation was previously difficult for other larger cameras.

The XC-E Series offer three different model ranges that only differ in spectral sensitivity as to suit various application environments. The XC-ES Series (XC-ES50/ES50CE, XC-ES50L/ES50LCE, XC-ES51/ES51CE and XC-ES30/ES30CE) are standard models for general use under visible light conditions. The XC-EI Series (XC-EI50/EI50CE and XC-EI30/EI30CE) offer excellent near-infrared sensitivity. Under low light conditions or when used with IR LED illumination systems, these cameras provide clear images. The XC-EU Series (XC-EU50/EU50CE) offer near-ultraviolet sensitivity in the i-line, or 365 nm, range. The short wavelength allows the XC-EU Series to capture very fine detail. All models have identical dimensions and controls, making them easy to interchange. A variety of settings are available for differing subject and lighting conditions. All camera control switches are accessible from the outside of the camera. Excellent vibration and shock characteristics make these cameras ideal for demanding machine vision applications.

* The XC-ES50L/ES50LCE, which are L-type versions of the XC-ES50/ ES50CE, measure 29 (W) x 42.5 (H) x 43.8 (D) mm.

Features

- XC-ES50/ES50CE/ES50L/ES50LCE/ES51/ES51CE/ EI50/EI50CE/EU50/EU50CE: 1/2 type IT CCD
- XC-ES30/ES30CE/EI30/EI30CE: 1/3 type IT CCD
- Compact and light weight: 29 (W) x 29 (H) x 30 (D) mm, 50 g except for XC-ES50L/ES50LCE: 29 (W) x 42.5 (H) x 43.8 (D) mm, 110 g
- Near-infrared sensitivity: XC-EI50/EI50CE, XC-EI30/EI30CE
- Near-ultraviolet sensitivity: XC-EU50/EU50CE
- Minimum illumination at F1.4:
  0.3 lx: XC-ES50/ES50CE/ES30/ES30CE
  3.0 lx: XC-ES50L/ES50LCE
  0.1 lx: XC-EI50/EI50CE
  0.2 lx: XC-ES51/ES51CE/EI30/EI30CE
- High S/N Ratio: 60 dB
- Electronic shutter function:
  1/100 to 1/10,000 s: EIA, 1/120 to 1/10,000 s: CCIR
- Flexible trigger shutter function
- Scanning system: 2:1 interlaced
- Frame/field exposure
- Restart/reset function
- Synchronization: internal/external (HD/VD)
- High shock and vibration tolerance
- Lead-free products

XC-E Series

Standard model

XC-ES50/ES50CE
XC-ES50L/ES50LCE
XC-ES51/ES51CE
XC-ES30/ES30CE

Applicable wavelength range
400-770 nm

300 400 700 800 900

Near IR model

XC-EI50/EI50CE
XC-EI30/EI30CE

Applicable wavelength range
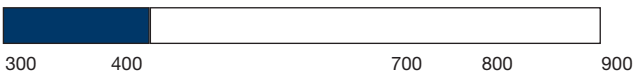400-770 nm

300 400 700 800 900

UV model

XC-EU50/EU50CE

Applicable wavelength range
300-420 nm

300 400 700 800 900

The XC-EU50/EU50CE models are compact and light-weight cameras that have near-ultraviolet sensitivity in the i-line, or 365 nm, range. Examples of typical application areas are PCB and solder inspection, document proofing, microscopy, medical and cosmetics applications. Using UV lighting, the short wavelength allows the XC-EU50/EU50CE models to capture clearly very fine detail and surface structures, which cannot be detected using visible or IR lighting, including very small scratches, dust or blemishes, as well as special fluorescent materials.

Spectral response
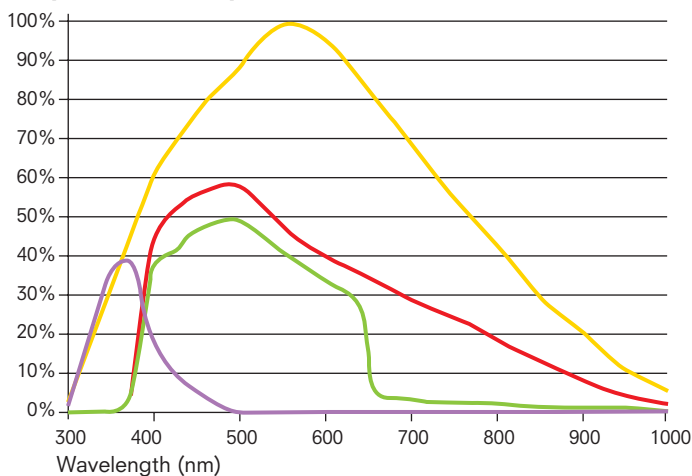
- XC-ES/ST Series
- XC-EI Series
- XC-EU Series
- Standard CCD with IR Cut Filters

Accessories

Compact camera adaptor
DC-700/700CE
- Compact, lightweight (700 g, 1 lb 8 oz)
- External sync IN/OUT
- Trigger input / WEN output
- New EIAJ standard 12 pin connector
- Dimensions: 110 (W) x 53 (H) x 160 (D) mm (4 3/8 x 2 1/2 x 6 3/8 inches)

12 pin camera cable (CE standard)
- CCXC-12P02N (2 m)
- CCXC-12P05N (5 m)
- CCXC-12P10N (10 m)
- CCXC-12P25N (25 m)

Tripod adaptor
VCT-333I
- ABS
- Approx. 6.1 g (0.2 oz)
- Dimensions: 18 (W) x 6 (H) x 27 (D) mm (2 2/32 x 1/4 x 1/8 inches)

Note following differences between models:
- XC-EI models are more sensitive than XC-ES models, not only in near-IR range but in visible range as well.
- XC-ES51/ES51CE has an improved sensitivity over XC-ES50/ES50CE.
- XC-EU models are only sensitive in near-UV range and are not susceptable to disturbance from surrounding visible light.
- XC-ES50L/ES50LCE include an IR Cut Filter.

	XC-ES50	XC-ES50L	XC-ES51	XC-ES30	XC-EI50	XC-EI30	XC-EU50
Image device	1/2 type IT CCD			1/3 type IT CCD	1/2 type IT CCD	1/3 type IT CCD	1/2 type IT CCD
Effective picture elements	768 (H) x 494 (V)						
Signal system	EIA (standard)						
Horizontal frequency	15.734 kHz						
Vertical frequency	59.94 Hz						
Cell size (µm)	8.4 x 9.8			6.35 x 7.4	8.4 x 9.8	6.35 x 7.4	8.4 x 9.8
Lens mount	C mount						
Flange back	17.526 mm						
Sync system	Internal/External (auto)						
External sync system	HD/VD (2 to 5 Vp-p)						
External sync frequency	± 1 %						
Jitter Less than	± 50 nsec						
Scanning system	2:1 Interlaced						
Video output	1.0 Vp-p, negative, 75 Ω unbalanced						
Horizontal resolution	570 TV lines						
Sensitivity (Gamma ON, MIN GAIN, No IR cut filter)	400 lx F5.6	400 lx F4	400 lx F8	400 lx F4	400 lx F11	400 lx F8	–
Minimum illumination*	0.3 lx	3.0 lx	0.2 lx	0.3 lx	0.1 lx	0.2 lx	–
S/N ratio	60 dB						
Gain	AGC/Manual selectable						
Gamma	ON/OFF selectable						
Normal shutter	1/100 to 1/10,000 s						
External trigger shutter**	1/4 to 1/10,000 s						
Power requirements	DC 12 V (+9 to +16 V)						
Power consumtion	1.6 W			1.4 W	1.6 W	1.4 W	1.6 W
Dimension (W) x (H) x (D)	29 x 29 x 30 mm	29 x 42.5 x 43.8 mm	29 x 29 x 30 mm				
Mass	50 g (2 oz)	110 g (4 oz)	50 g (2 oz)				
Operating temperature	-5 to +45 °C (23 to 104 °F)						
Operating humidity	20 to 80 %						
Storage temperature	-30 to +60 °C (-22 to +140 °F)						
Storage humidity	20 to 95 %						
Vibration resistance	10 G (20 to 200 Hz)						
Shock resistance	70 G						
MTBF	126,000 hrs.						
Regulatory compliance	UL1492, FCC Class B Digital Device, CE (EN61326/97 + A1/98), AS4251.1 + AS4252.2						
Supplied accessories	Lens mount cap (1), Operating instructions (1)						

* (F1.4, AGC ON, without IR cut filter) ** Using Dip switch on the rear panel or Using trigger pulse width

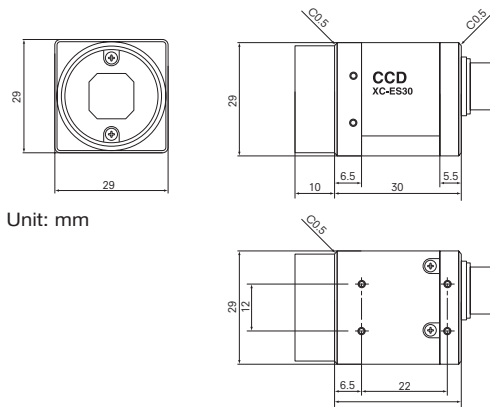|	XC-ES50CE	XC-ES50LCE	XC-ES51CE	XC-ES30CE	XC-EI50CE	XC-EI30CE	XC-EU50CE
Image device	1/2 type IT CCD			1/3 type IT CCD	1/2 type IT CCD	1/3 type IT CCD	1/2 type IT CCD
Effective picture elements	752 (H) x 582 (V)						
Signal system	CCIR (standard)						
Horizontal frequency	15.625 kHz						
Vertical frequency	50 Hz						
Cell size (µm)	8.6 x 8.3			6.5 x 6.25	8.6 x 8.3	6.5 x 6.25	8.6 x 8.3
Lens mount	C mount						
Flange back	17.526 mm						
Sync system	Internal/External (auto)						
External sync system	HD/VD (2 to 5 Vp-p)						
External sync frequency	± 1 %						
Jitter Less than	± 50 nsec						
Scanning system	2:1 Interlaced						
Video output	1.0 Vp-p, negative, 75 Ω unbalanced						
Horizontal resolution	560 TV lines						
Sensitivity (Gamma ON, MIN GAIN, No IR cut filter)	400 lx F5.6	400 lx F4	400 lx F8	400 lx F4	400 lx F11	400 lx F8	–
Minimum illumination*	0.3 lx	3.0 lx	0.2 lx	0.3 lx	0.1 lx	0.2 lx	–
S/N ratio	60 dB						
Gain	AGC/Manual selectable						
Gamma	ON/OFF selectable						
Normal shutter	1/120 to 1/10,000 s						
External trigger shutter**	1/4 to 1/8,000 s						
Power requirements	DC 12 V (+9 to +16 V)						
Power consumtion	1.6 W			1.4 W	1.6 W	1.4 W	1.6 W
Dimension (W) x (H) x (D)	29 x 29 x 30 mm	29 x 42.5 x 43.8 mm	29 x 29 x 30 mm				
Mass	50 g (2 oz)	110 g (4 oz)	50 g (2 oz)				
Operating temperature	-5 to +45 °C (23 to 104 °F)						
Operating humidity	20 to 80 %						
Storage temperature	-30 to +60 °C (-22 to +140 °F)						
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* (F1.4, AGC ON, without IR cut filter) ** Using Dip switch on the rear panel or Using trigger pulse width

Connection Diagram

C-mount lens

VCL-08YM

VCL-12YM

VCL-16Y-M

VCL-25Y-M

VCL-50Y-M

LO-77ERK
Extension rings kit

Tripod adaptor
VCT-333I

Camera adaptor
DC-700/700CE
(New EIAJ standard 12 pin connector)

AC
VIDEO OUT
HD/VD
WEN
TRIG

	Camera cable
XC-ES50/ES50CE	CCXC-12P02N
XC-ES50L/ES50LCE*²	CCXC-12P05N
XC-ES30/ES30CE	CCXC-12P10N
XC-EI50/EI50CE	CCXC-12P25N
XC-EI30/EI30CE	
XC-EU50/EU50CE	

*1 Only VCL-50Y-M is applicable to the XC-EU50/EU50CE.
*2 The XC-ES50L/ES50LCE cannot be attached to the VCT-333I.
*3 HD/VD is not available at C.SYNC.

Dimensions & Rear Panel

XC-ES50/ES50CE/ES51/ES51CE/ES30/ES30CE
XC-EI50/EI50CE/EI30/EI30CE/EU50/EU50CE

CCD
XC-ES30

Unit: mm

XC-ES50L/ES50LCE

CCD
XC-ES50L

4-M3 depth 5

Factory setting mode of rear panel

12-pin multi-connector

VIDEO OUT/DC IN/SYNC

SHUT
FR/FL
TRIG
γ
M/AGC

ON OFF   MIN MAX   EXT INT
75Ω   M GAIN   HD/VD

① ② ③ ④

No.	Switch name		Factory-setting mode
①	Shutter speed/Mode setting DIP switch	Dip switch 1-4: Shutter speed	OFF
		Dip switch 5: FRAME/FIELD	FRAME
		Dip switch 6-8: External trigger shutter mode, restart/reset mode	Normal
		Dip switch 9: Gamma ON/OFF	OFF
		Dip switch 0: GAIN	Manual
②	Manual GAIN (M GAIN) control knob		Twelve o'clock position
③	HD/VD signal input/output switch		EXT
④	75 Ω termination switch		ON
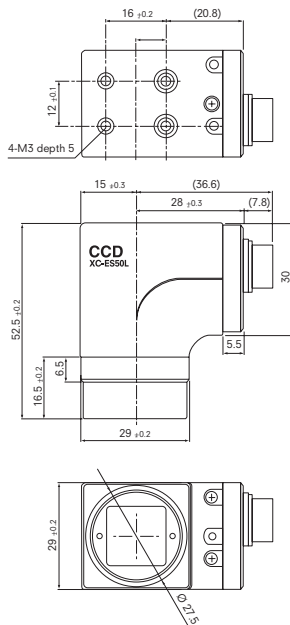
12-pin multi-connector
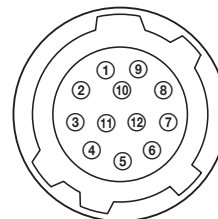
Pin No.	External sync (HD/VD)	Internal sync (HD/VD)
①	GND	GND
②	+12 V	+12 V
③	GND	GND
④	VIDEO output	VIDEO output
⑤	GND	GND
⑥	External HD input	Internal HD output
⑦	External VD input*¹	Internal VD output
⑧	GND	GND
⑨	-	-
⑩	WEN output*²	WEN output*²
⑪	TRIG input	TRIG input
⑫	GND	GND

*1 HD/VD input is required when using restart, reset mode.
*2 WEN output works only when in external trigger shutter mode.

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