

**Watec**

**WATEC CO., LTD.**

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# 1/2.8" Compact High Sensitivity Network Camera

SD card recording in the same size as the WAT-902 series (Dimensions: H34xW34xD50mm)

**WAT-2400S** (Color)

**WAT-933** (Monochrome)

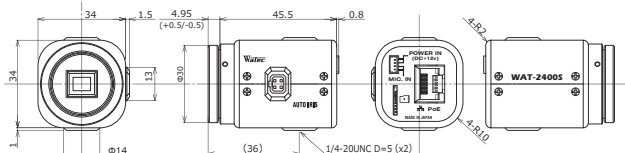


**Key features**

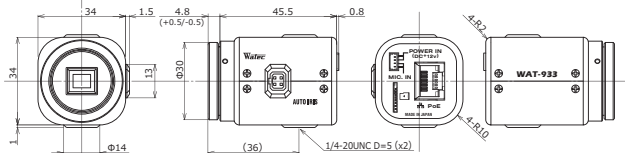
- Supporting microSD enables stand-alone recording without the network connection
- Video output quick start-up in 6 sec.
- Power-saving PoE : 3.12W/65mA DC+12V : 2.16W/180mA

**Dimensions**

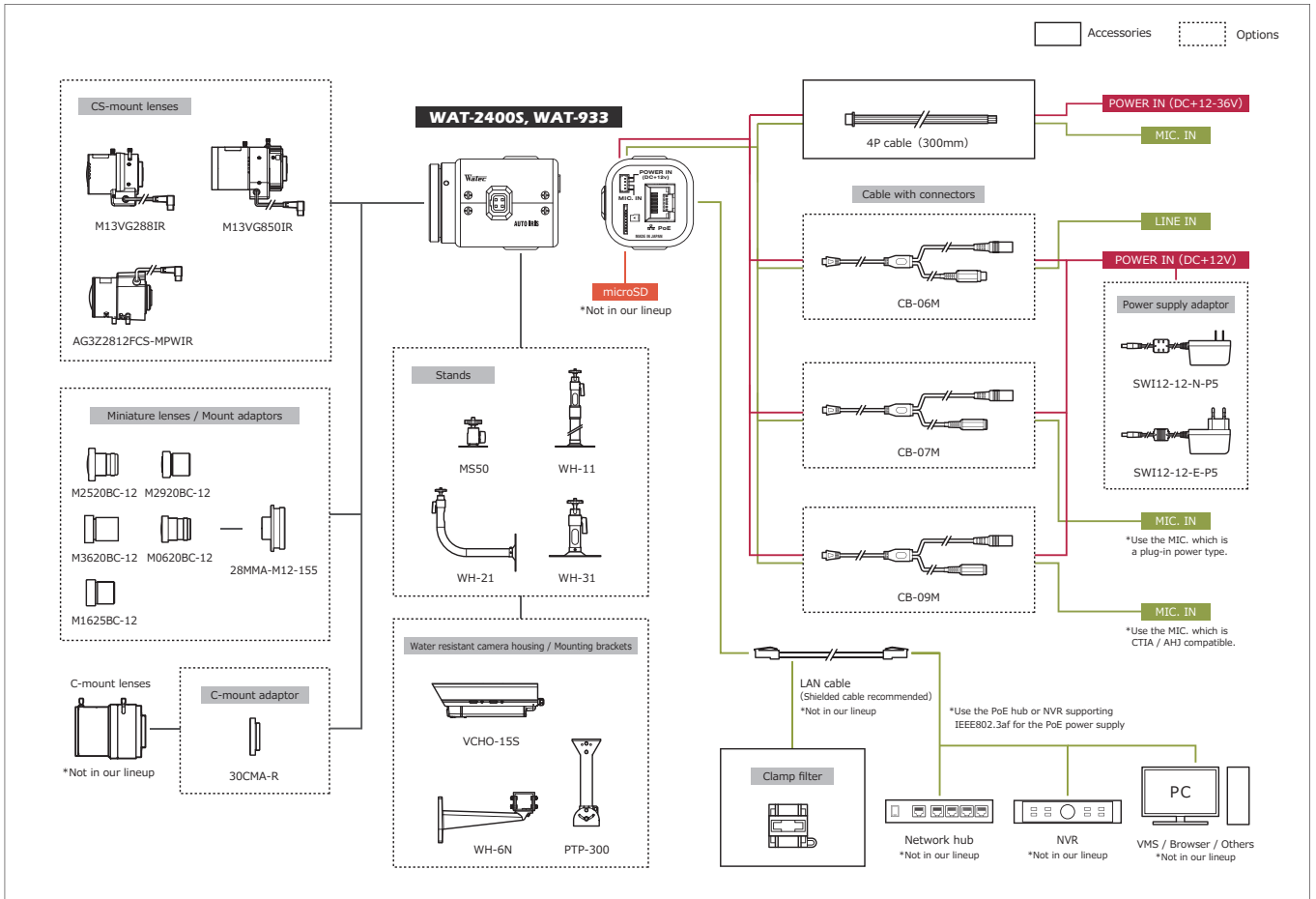
**WAT-2400S**



**WAT-933**



**System diagram**



**Specifications**

Model		WAT-2400S	WAT-933
Pick-up element		1/2.8 inch BSI CMOS image sensor	
Number of effective pixels		1945(H) x 1097(V)	
Unit cell size		2.9µm(H) x 2.9µm(V)	
Imaging system		RGB primary color bayer arrangement mosaic filter on chip	
Synchronizing system		Internal	
Scanning system		Progressive	
Output size		1920x1080, 1280x720, 800x600, 704x480, 704x400, 640x480, 640x360, 320x240	
Max. frame rate		60 fps *1	
Video compression		H.264, MJPEG	
Minimum illumination		0.007 lx F1.2 (AGC HIGH=72dB, Shutter=OFF)	0.0001 lx F1.4 (AGC HIGH=72dB, Shutter=OFF)
S/N		-	
Function settings		Browser *2	
AE mode	Fixed	1/30, 1/60, 1/120, 1/250, 1/500, 1/1000, 1/2000, 1/4000, 1/8000, 1/15000, 1/30000 (sec.) *3	
		1/25, 1/50, 1/100, 1/200, 1/400, 1/800, 1/1600, 1/3200, 1/6400, 1/12800, 1/25600 (sec.) *4	
	EI	1/30 - 1/30000 (sec.) *3, 1/25 - 1/25600 (sec.) *4 x32 - 1/30000 (sec.) *3 *5, x32 - 1/25600 (sec.) *4 *5	
White balance		ATW, PWB, MWB, PRESET (3000K, 5000K, 8000K)	
AGC	ON	0 - 72dB *6	
	OFF	0dB	
MGC		-	
Day/Night		-	
Gamma Characteristics		γ=0.45, 0.55, 0.65, 0.75	
Noise reduction		3DNR OFF/ON (Level adjustable)	
Wide dynamic range		WDR OFF/ON (Level adjustable)	
Lens iris		DC	
Back light compensation		BLC, HSBLC	
White blemish correction		ON	
Sharpness		Level adjustable	
Defog		OFF/ON (Level adjustable)	
Digital zoom		-	
Privacy mask		16 masks	
Mirror image		OFF, V-FLIP, H-FLIP, HV-FLIP	
Freeze		-	
Motion detection		OFF/ON 4 areas arbitrarily configurable	
Neg. image		-	
ONVIF		profile S	
Supported protocols		TCP/IP, UDP/IP, RTP(RTCP), RTSP, SNMP, HTTP, FTP, DHCP, DNS	
Interface		RJ45 (10BASE-T, 100BASE-TX), 4P Connector (MIC. IN, POWER IN), Auto iris, microSD *7	
Power supply		PoE +48V (IEEE802.3af), DC+12 - 36V *+12V is recommended for DC input	
Power consumption		3.12W/65mA (PoE +48V), 2.16W/180mA (DC +12V)	
Operating / Storage temperature		0 - +50°C / -30 - +70°C	
Operating / Storage humidity		95% RH or less (Without condensation)	
Lens mount		CS mount (Back focus adjustable)	
Weight		Approx. 83g	
Accessories		4P cable, Hex. wrench, Clamp filter	

\*1: When set to 720P or lower \*2: Google Chrome recommended \*3: Frequency=60Hz \*4: Frequency=50Hz \*5: When using the Slow Shutter \*6: AGC MAX is variable from 0 - 72dB \*7: microSD (Recommended operating conditions: SDHC/SDXC standard, MLC type or high endurance model, Speed Class CLASS 10 or more, Capacity of 256GB or less)

# WAT-2400 1/2.8" Full HD Network Camera

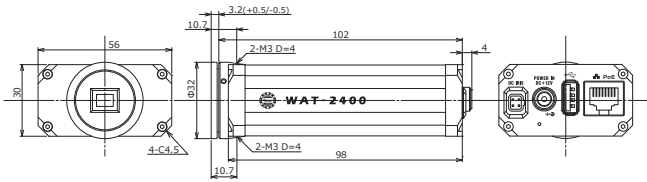
Full HD CMOS sensor



### Key features

- Customization flexible firmware (Required software can be included to the camera)
- 1/2.8 inch 2 Mega pixel CMOS image sensor with high sensitivity
- Min. illumination 0.1 lx F1.2 (AGC HIGH=66dB, Shutter=OFF)
- H.264 Video compression format
- PoE (IEEE802.3af) & DC+12 input
- ONVIF® profile S compliant

### Dimensions

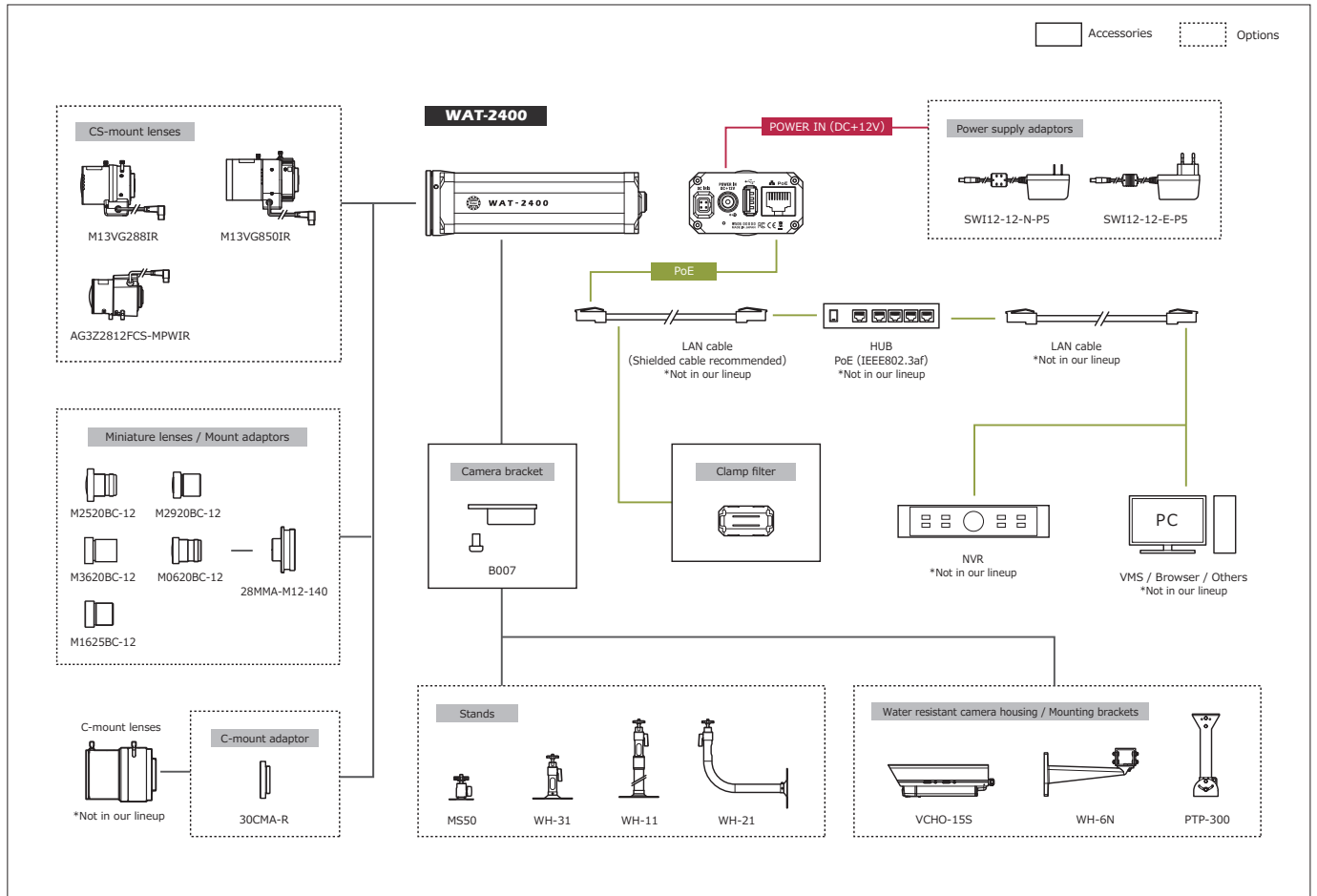


### Specifications

Pick-up element	1/2.8 inch CMOS image sensor	
Number of effective pixels	1994(H) × 1244(V)	
Unit cell size	2.8µm(H) × 2.8µm(V)	
Imaging system	RGB+W array mosaic filters on chip	
Synchronizing system	Internal	
Scanning system	Progressive	
Output size	1920×1080, 1280×720	
Max. frame rate	30 fps	
Video compression	H.264, MJPEG	
Minimum illumination	0.1 lx F1.2 (AGC HIGH=66dB, Shutter=OFF)	
S/N	More than 50dB (AGC OFF=0dB, γ=1.0)	
Function settings	Browser	
AE mode	Fixed	1/5 - 1/10000 sec. (1/10000 sec. step)
	EI	1/30 - 1/10000 sec.
White balance	ATW, PWB, MWB	
AGC	ON	0 - 42dB
	OFF	-
MGC	0 - 66dB (3dB step)	
Day/Night	-	
Noise reduction	-	
Wide dynamic range	-	
Lens iris	DC	
Back light compensation	-	
White blemish correction	-	
Sharpness	Level adjustable	
Defog	-	
Digital zoom	-	
Privacy mask	-	
Mirror image	-	
Freeze	-	
Motion detection	-	
Neg. image	-	
ONVIF	profile S	
Supported protocols	TCP/IP, UDP/IP, RTP(TCP), RTP(TCP), RTCP, RTSP, NTP,	
	HTTP, FTP, DHCP, DNS, TELNET, SSH, SNMP, ARP, ICMP, Bonjour	
Interface	RJ45 (10BASE-T, 100BASE-TX), USB (High Speed / Full Speed), Auto iris, Power in	
Power supply	PoE +48V, DC+12V±10%	
Power consumption	5.4W/450mA (DC+12V), 5.6W/127mA (PoE+48V)	
Operating temperature	-10 - +40°C	
Storage temperature	-30 - +70°C	
Operating / Storage humidity	95% RH or less (Without condensation)	
Lens mount	CS mount (Back focus adjustable)	
Weight	Approx. 195g	
Accessories	WPDC12 (DC plug), Hex. Wrench, B007 (Camera Bracket), Clamp Filter	

\*ONVIF is a trademark of Onvif, Inc.

### System diagram



# 1/2.8" Professional High Sensitivity 3G/HD-SDI Camera

Versatile 3G/HD-SDI camera for various applications

## WAT-2200 Mk-2 (Color)    WAT-3200 (Monochrome)

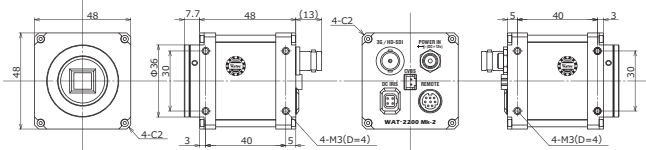


### Key features

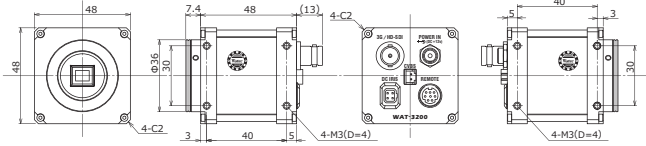
- 1/2.8 inch BSI CMOS image sensor with high sensitivity
- Full HD 1080/60p resolution with 3G-SDI/HD-SDI interface and low latency
- OSD (On Screen Display) - Easy installation through a controller provided in kit

### Dimensions

#### WAT-2200 Mk-2



#### WAT-3200

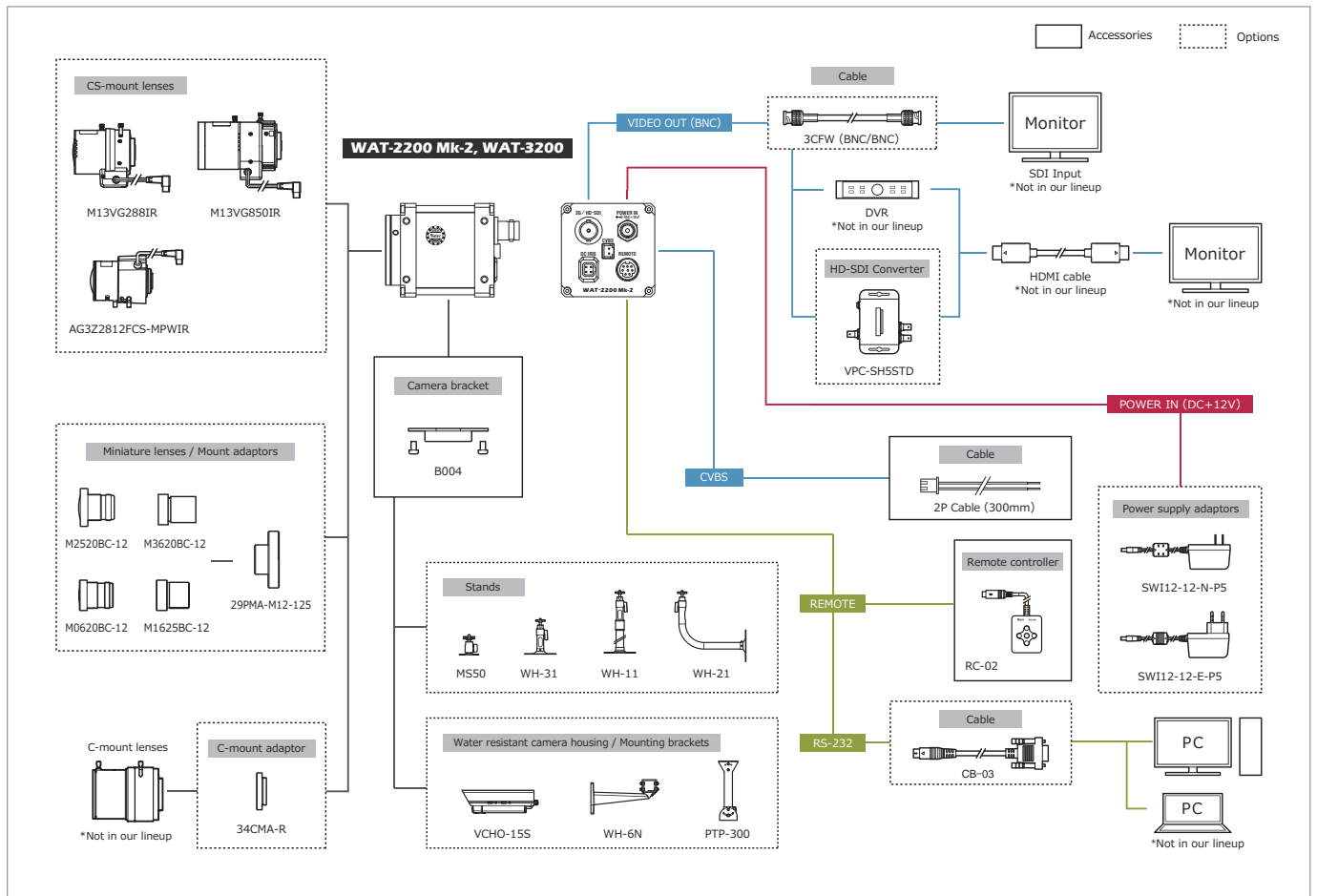


### Specifications

Model		WAT-2200 Mk-2	WAT-3200
Pick-up Element		1/2.8 inch BSI CMOS image sensor	
Number of Effective Pixels		1945(H) × 1097(V)	
Unit Cell Size		2.9μm(H) × 2.9μm(V)	
Imaging System		RGB primary color bayer arrangement mosaic filter on chip	—
Synchronizing System		Internal	
Scanning System		Progressive	
Video Outputs		3G-SDI, HD-SDI, Composite video:1.0 V(p-p) 75Ω (Unbalanced)	
Output Format		1080/60p, 1080/59.94p, 1080/50p, 1080/60i, 1080/59.94i, 1080/50i, 1080/30p,	
		1080/29.97p, 1080/25p, 1080/24p, 720/60p, 720/59.94p, 720/50p, NTSC, PAL	
Resolution(H)		More than 1000 (Center)	
Min. Illumination		0.006 lx F1.2 (AGC HIGH=72dB, Shutter=OFF)	0.0001 lx F1.4 (AGC HIGH=72dB, Shutter=OFF)
		0.0004 F1.2 (AGC HIGH=72dB, Shutter=x15)	0.000007 lx F1.4 (AGC HIGH=72dB, Shutter=x15)
S/N		More than 55dB (AGC OFF=0dB, γ=1.0)	
Function Setting		OSD : Remote controller, RS-232 (Pelco-D, Pelco-P), Communication: RS-232 (Pelco-D, Pelco-P, Visca)	
AE Mode	Fixed	x2, x3, x4, x5, x6, x7, x8, x9, x10, x12, x15 (frame)	
		1/30, 1/60, 1/120, 1/180, 1/240, 1/300, 1/500, 1/1000, 1/2000, 1/5000, 1/10000 sec.*1	
		1/25, 1/50, 1/100, 1/150, 1/200, 1/250, 1/500, 1/1000, 1/2000, 1/5000, 1/10000 sec.*2	
Ei	1/30 - 1/10000 sec.*1, 1/25 - 1/10000 sec.*2		
	x15 - 1/10000 sec.		
White Balance		ATW, PWB, MWB	—
AGC	ON	0 - 36dB(LOW), 0 - 50dB(MID), 0 - 72dB(HIGH)	—
	OFF	0dB	
MGC		0 - 72dB (5dB Step)	
Day/Night		—	
Gamma Characteristics		γ=USER (Level adjustable)	
Noise Reduction		3DNR OFF/ON Level adjustable, 2DNR OFF/ON Level adjustable, 3D+2DNR ON Level adjustable	
Wide Dynamic Range		WDR OFF/ON Level adjustable, D-WDR OFF/ON Level adjustable	
Lens Iris		DC	
Back Light Compensation		BLC, HSBLC	
White Blemish Correction		Up to 2046 pixels	
Sharpness		OFF/ON Level adjustable	
Defog		OFF/ON Level adjustable	
Digital Zoom		ZOOM (x1.01 - x6.00), PAN/TILT	
Privacy Mask		8 masks	
Mirror Image		OFF, V-FLIP, H-FLIP, HV-FLIP	
Freeze		OFF/ON	
Motion Detection		OFF/ON 4 areas arbitrarily configurable	
Neg. Image		OFF/ON	
Interface		BNC (3G/HD-SDI), 2P connector (Composite video), Power in, Auto iris, mini DIN8P (RC-02, RS-232)	
Power Supply		DC+12V ±10%	
Power Consumption		2.52W (210mA)	
Operating / Storage Temperature		-10 - +50°C / -30 - +70°C	
Operating / Storage Humidity		95%RH or Less (Without condensation)	
Lens Mount		CS mount	
Weight		Approx. 130g	
Accessories		WPDC12-R (DC plug), 2P Cable, Hex. Wrench, B004 (Camera Bracket), RC-02 (Remote controller)	

\*1: Output Format=60/59.94/30fps \*2: Output Format=50/25/24fps

### System diagram



# WAT-1300 (G3.6) 1/3.2" Ultra-compact High Sensitivity Day/Night Camera

Ultra-compact, lightweight, and low-voltage design ideal for embedded applications

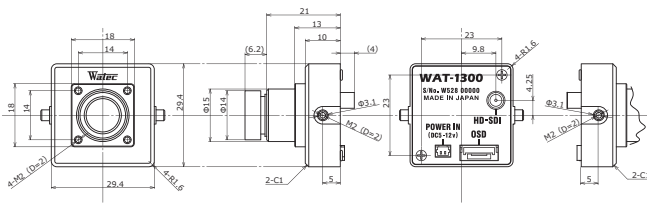


\*No CE & FCC

### Key features

- HD-SDI 720/60p and 50p output formats enable smooth video recording with minimal delay
- Low power consumption and low heat generation by using a 1 megapixel sensor
- High sensitivity enables clear images even in low-light environments
- Despite its small size, the camera is equipped with a day/night function by using a dual-pass filter
- Various optional M12 lenses available \*Std. lens: G3.6
- Advanced setting available by OSD (On Screen Display) through an optional remote controller

### Dimensions

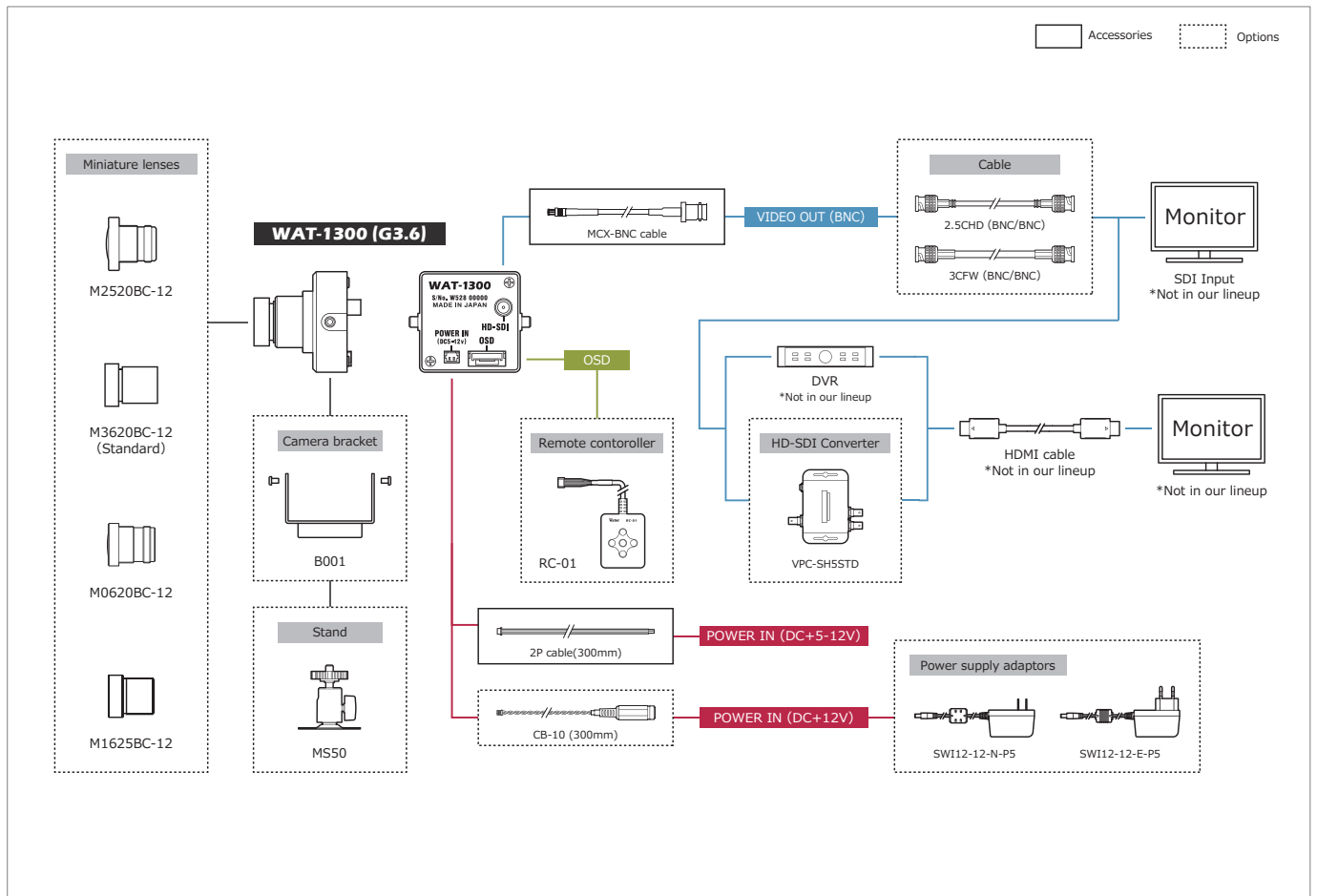


### Specifications

Pick-up element	1/3.2 inch BSI CMOS image sensor	
Number of effective pixels	1280(H) × 720(V)	
Unit cell size	3.5µm(H) × 3.5µm(V)	
Imaging system	RGB+W array mosaic filters on chip	
Synchronizing system	Internal	
Scanning system	Progressive	
Video outputs	HD-SDI	
Output format	720/60p, 720/50p*	
Resolution (H)	More than 650 (Center)	
Minimum illumination	0.006 lx F2.0 (AGC ON=54dB, Shutter=OFF)	
S/N	More than 50dB (AGC OFF=0dB, γ=1.0)	
Function settings	OSD : Remote controller	
AE mode	Fixed	1/60 (1/50), 1/100, 1/120, 1/125, 1/500, 1/1000, 1/2000, 1/4000, 1/8000, 1/10000, 1/20000, 1/50000, 1/100000 sec.
	EI	1/60 (1/50) - 1/100000 sec.
White balance	ATW, AWB, PWB, MWB, USER1, USER2	
AGC	ON	0 - 54dB
	OFF	0dB
MGC	0 - 54dB (6dB step)	
Day/Night	ICR mechaless Day/Night	
Gamma characteristics	γ=0.45	
Noise reduction	2DNR OFF/ON Level adjustable	
Wide dynamic range	WDR OFF/ON Level adjustable, D-WDR OFF/ON Level adjustable	
Lens iris	-	
Back light compensation	BLC, HSBLC	
White blemish correction	-	
Sharpness	Level adjustable	
Defog	OFF/ON Level adjustable	
Digital zoom	-	
Privacy mask	16 masks	
Mirror image	OFF, V-FLIP, H-FLIP, HV-FLIP	
Freeze	-	
Motion detection	-	
Neg. image	-	
Interface	MCX connector (75Ω), 2P connector (Power in), Remote controller (RC-01)	
Power supply	DC+5V - 12V	
Power consumption	0.9W/180mA (DC+5V), 0.9W/75mA (DC+12V)	
Operating / Storage Temperature	-10 ~ +50°C / -30 ~ +70°C	
Operating / Storage Humidity	95% RH or less (Without condensation)	
Lens mount	M12 P=0.5	
Standard lens	M3620BC-12 (f3.6 F2.0)	
Weight	Approx. 32g	
Accessories	2P cable, MCX-BNC cable	

\*Set at factory

### System diagram

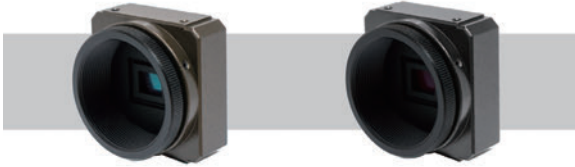




# 1/2.8" Compact USB2.0 Full HD Camera

Compact design specialized for embedding images directly into a PC

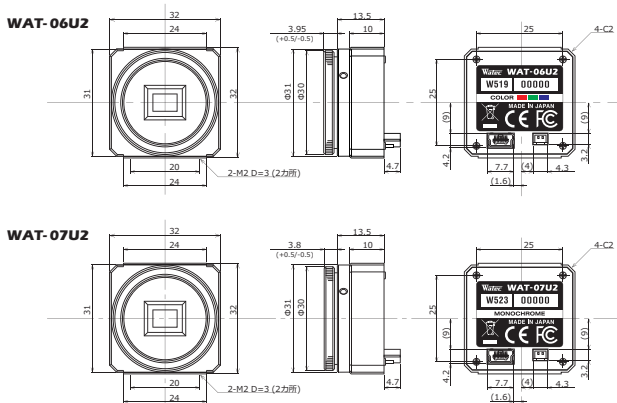
## WAT-06U2 (Color)      WAT-07U2 (Monochrome)



### Key features

- The internal ISP (Image Signal Processor) enables optimal image quality for your usage
- USB Video Class & USB Bus Power (plug & play)
- Simple viewer software with features to change the camera settings and capture images

### Dimensions

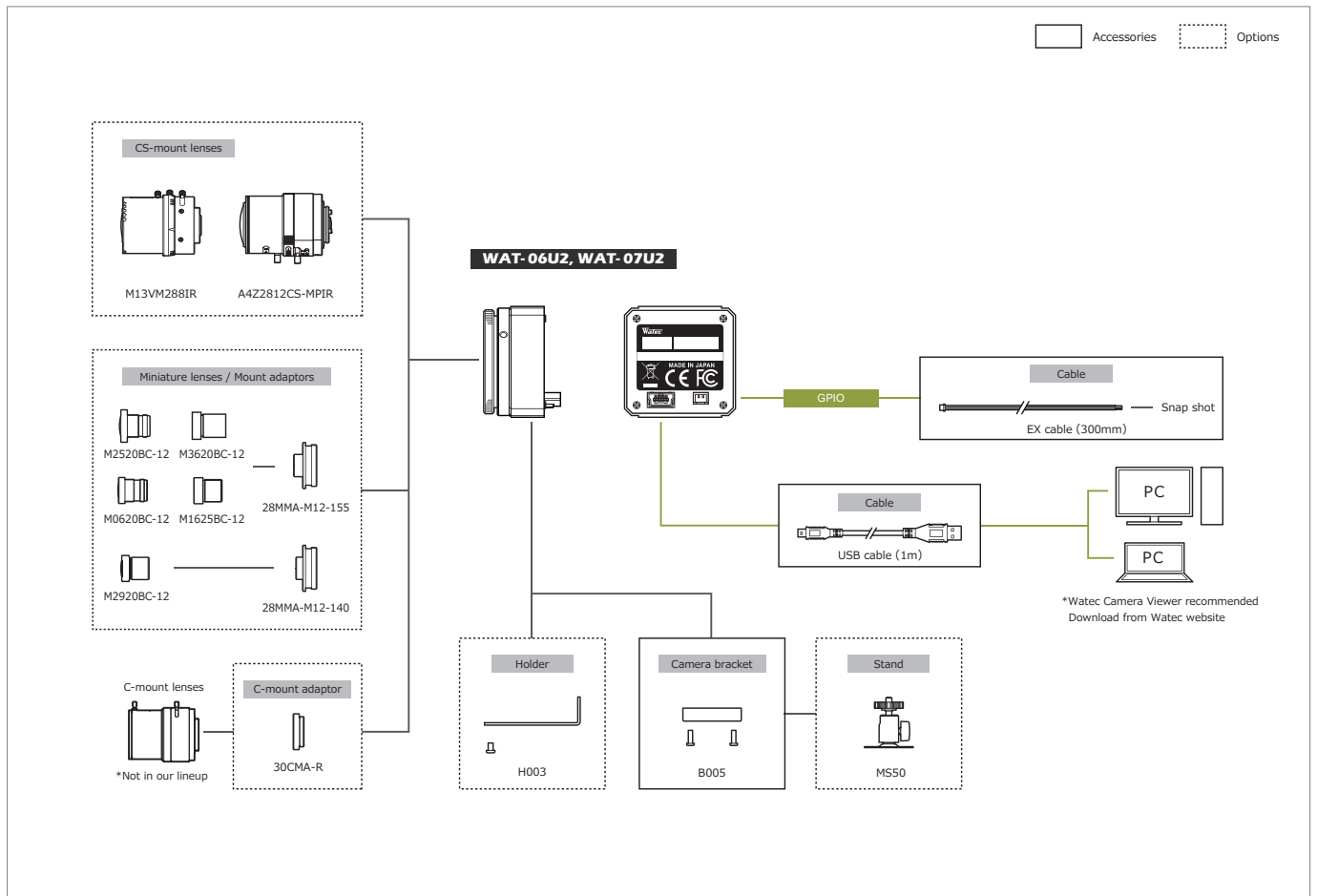


### Specifications

Model	WAT-06U2	WAT-07U2
Pick-up element	1/2.8 inch BSI CMOS image sensor	
Number of effective pixels	1945(H) × 1097(V)	
Unit cell size	2.9μm(H) × 2.9μm(V)	
Imaging system	RGB primary color bayer arrangement mosaic filter on chip	
Synchronizing system	Internal	
Scanning system	Progressive	
Output size	1920x1080, 1280x720, 640x480, 320x240	
Max. frame rate	30 fps	
Video compression	MPG, YUY2	
Video output	USB Video Class (Compatible)	
Resolution (H)	More than 900 (Center)	More than 800 (Center)
Minimum illumination	0.1 lx F1.2 (AGC ON=36dB, Shutter=OFF)	0.002 lx F1.4 (AGC ON=36dB, Shutter=OFF)
	0.025 lx F1.2 (AGC ON=36dB, Shutter=1/7.5 sec.)	0.0005 lx F1.4 (AGC ON=36dB, Shutter=1/7.5 sec.)
S/N	-	
Function settings	Camera Viewer	
AE mode	Fixed	1/15, 1/7.5, 1/4 sec.
	EI	1/30, 1/60, 1/120, 1/250, 1/500, 1/1000, 1/2000, 1/4000, 1/8000 sec.
		1/30 - 1/8000 sec.
	1/7.5 - 1/8000 sec.	
White balance	ATW, MWB	
AGC	ON	0 - 36dB
	OFF	-
MGC	0 - 72dB (1dB step)	
Gamma characteristics	γUSER (Level adjustable)	
Noise reduction	-	
Wide dynamic range	-	
Lens iris	-	
Back light compensation	BLC	
White blemish correction	-	
Sharpness	Level adjustable	
Defog	-	
Digital zoom	x1, x1.38, x2.25 *1, x1, x1.2, x1.5 *2	
Privacy mask	-	
Mirror image	-	
Freeze	-	
Motion detection	-	
Neg.image	-	
Interface	USB2.0 Mini-B, 2P connector (Snap shot)	
Power supply	USB +5V	
Power consumption	0.65W (130mA)	
Operating / Storage Temperature	-10 - +50°C / -30 - +70°C	
Operating / Storage Humidity	95% RH or less (Without condensation)	
Lens mount	CS mount (Back focus adjustable)	
Cable length	Shorter than 3.0m recommended	
Weight	Approx. 35g	
Accessories	Hex wrench, Camera bracket, EX cable, USB cable (USB2.0 Mini-B to Standard-A)	
Recommended System Specifications	CPU	Intel® Core™ i Series
	RAM	2GB or larger
	Others	USB2.0 Port, 1920×1080 or better resolution display
Operation Confirmed OS	Windows 10 32bit/64bit, Windows 11	

\*1: Output format: 640x480 \*2: Output format: 1280x720

### System diagram



\*Watec Camera Viewer recommended  
Download from Watec website

# 1/2.8" Ultra-Compact USB2.0 Full HD Camera

Ultra-compact design enables the camera to be installed anywhere from surveillance to embedded applications

**WAT-08U2(G3.6)** (Color)    **WAT-09U2(G3.6)** (Monochrome)



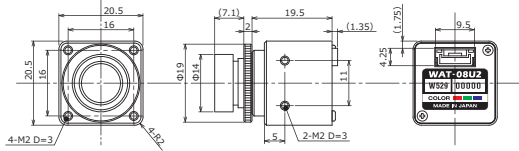
\*No CE&FCC

### Key features

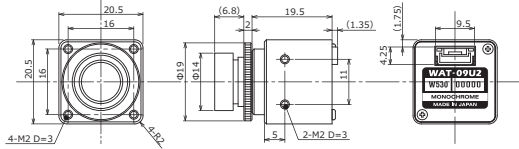
- 1/2.8 inch CMOS sensor with high quality video output at 30fps in Full HD
- USB Video Class & USB Bus Power (plug & play)
- Lens fixing ring prevents misalignment of focus
- Ideal for embedding due to the special designed USB connector reduces depth
- Various optional M12 lenses available \*Std. lens: G3.6

### Dimensions

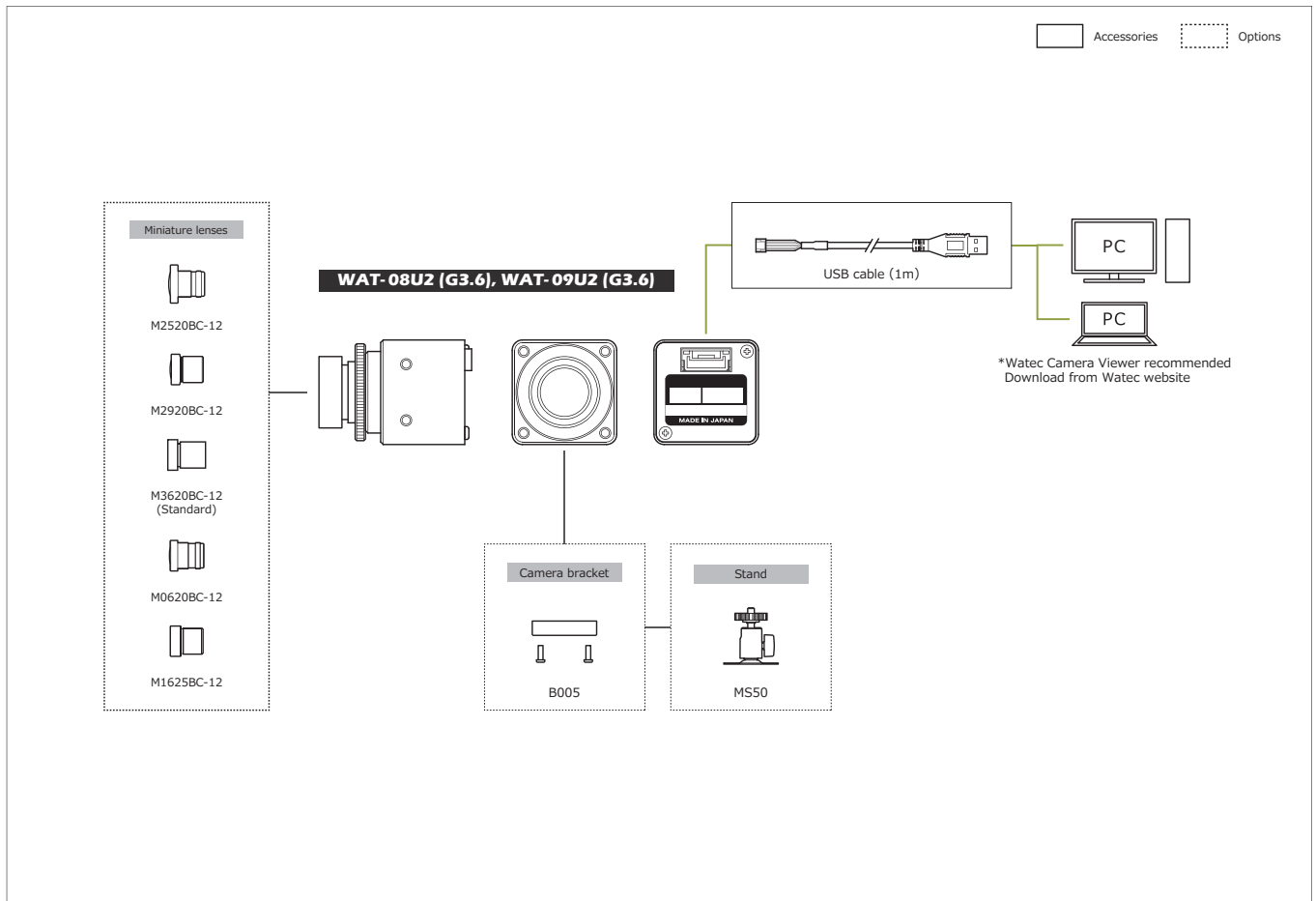
#### WAT-08U2 (G3.6)



#### WAT-09U2 (G3.6)



### System diagram



### Specifications

Model	WAT-08U2(G3.6)	WAT-09U2(G3.6)
Pick-up element	1/2.8 inch BSI CMOS image sensor	
Number of effective pixels	1945(H) × 1097(V)	
Unit cell size	2.9µm(H) × 2.9µm(V)	
Imaging system	RGB primary color bayer arrangement mosaic filter on chip	—
Synchronizing system	Internal	
Scanning system	Progressive	
Output size	1920x1080, 1280x720, 640x480, 320x240	
Max. frame rate	60 fps	
Video compression	MJPEG, YUY2	
Video output	USB Video Class (Compatible)	
Resolution (H)	More than 900 (Center)	More than 800 (Center)
Minimum illumination	0.3 lx F2.0 (AGC ON=36dB, Shutter=OFF)	0.004 lx F2.0 (AGC ON=36dB, Shutter=OFF)
S/N	0.07 lx F2.0 (AGC ON=36dB, Shutter=1/7.5 sec.)	0.001 lx F2.0 (AGC ON=36dB, Shutter=1/7.5 sec.)
Function settings	Camera Viewer	
AE mode	Fixed	1/15, 1/7.5, 1/4 sec.
	EI	1/30, 1/60, 1/120, 1/250, 1/500, 1/1000, 1/2000, 1/4000, 1/8000 sec.
		1/30 - 1/8000 sec.
White balance	ATW, MWB	—
AGC	ON	0 - 36dB
	OFF	—
MGC	0 - 72dB (1dB step)	
Gamma characteristics	γUSER (Level adjustable)	
Noise reduction	—	
Wide dynamic range	—	
Lens iris	—	
Back light compensation	BLC	
White blemish correction	—	
Sharpness	Level adjustable	
Defog	—	
Digital zoom	×1, ×1.38, ×2.25 *1, ×1, ×1.2, ×1.5 *2	
Privacy mask	—	
Mirror image	—	
Freeze	—	
Motion detection	—	
Neg. image	—	
Interface	USB (High speed)	
Power supply	USB +5V	
Power consumption	0.75W (150mA)	
Operating / Storage Temperature	-10 - +50°C / -30 - +70°C	
Operating / Storage Humidity	95% RH or less (Without condensation)	
Lens mount	M12 P=0.5	
Standard lens	M3620BC-12 (f3.6 F2.0)	
Cable length	1.0m (Max. 3.0m)	
Weight	Approx. 18g	
Accessories	USB cable (USB2.0 Standard-A), M12 Lens Fixing Ring	
Recommended System Specifications	CPU	Intel® Core™ I Series
	RAM	2GB or larger
	Others	USB2.0 Port, 1920x1080 or better resolution display
Operation Confirmed OS	Windows 10 32bit/64bit, Windows 11, Android 4.0 or later	

\*1: Output format: 640x480 \*2: Output format: 1280x720

# IP67-Rated USB2.0 Full HD Color Camera

**NEW**

## WAT-08U2D (G2.5) WAT-08U2D (G3.6)



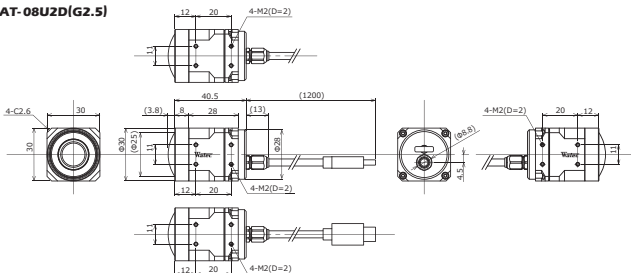
\*No CE&FCC

### Key features

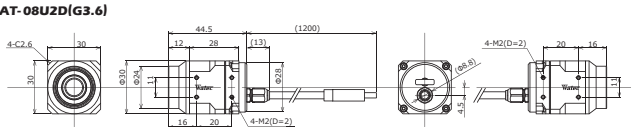
- USB Video Class & USB Bus Power (plug & play)
- Suitable for use in outdoor environments exposed to dust and water drops (IP67 compliant)
- High durability with tempered glass and aluminum housing
- Standard USB connector is Type-C, but Type-A version of "WAT-08U2D (G\*\*\*) Type-A" and Micro-B version of "WAT-08U2D (G\*\*\*) Micro-B" are also available.

### Dimensions

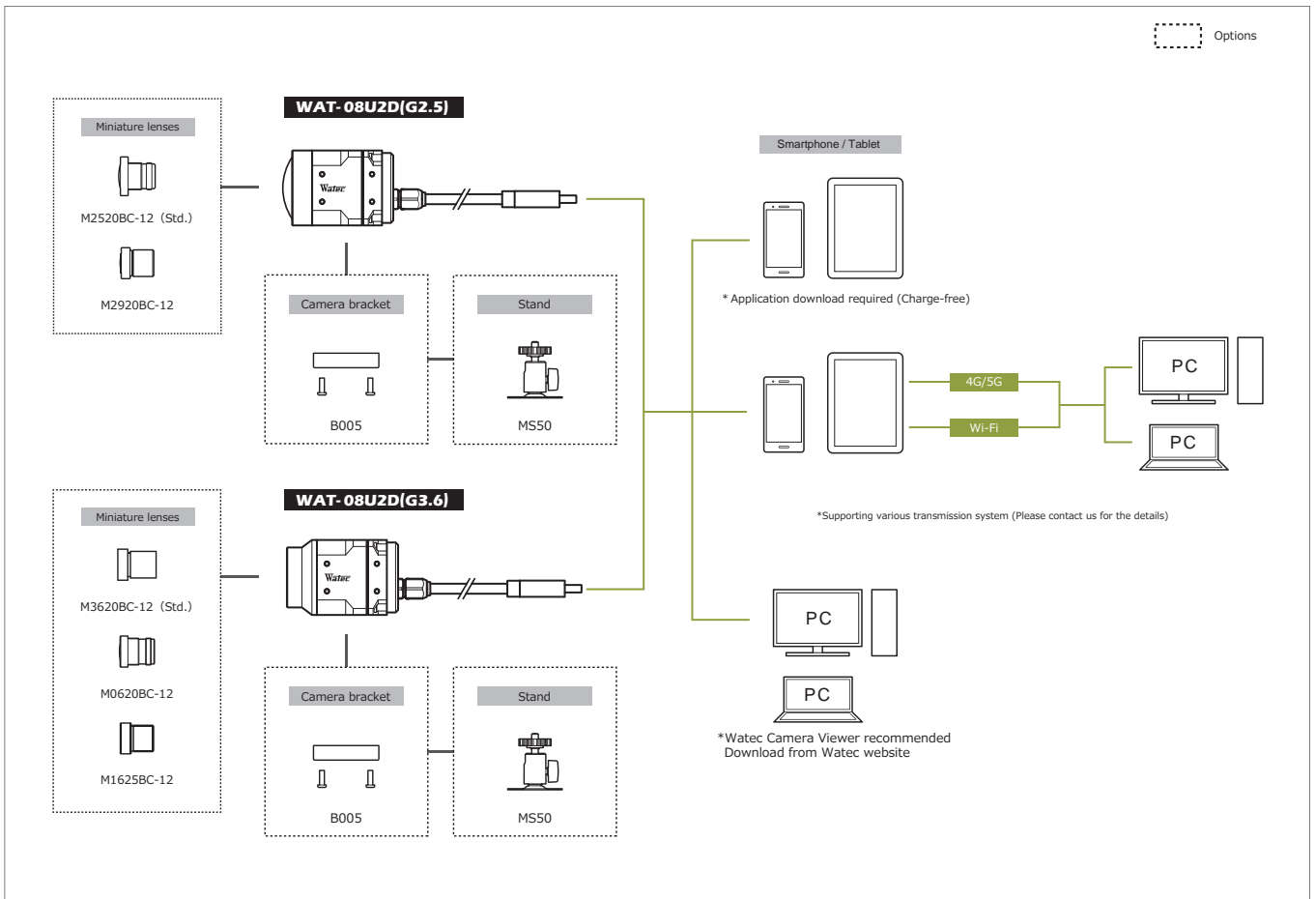
#### WAT-08U2D(G2.5)



#### WAT-08U2D(G3.6)



### System diagram



### Specifications

Pick-up element	1/2.8 inch BSI CMOS image sensor	
Number of effective pixels	1945(H) × 1097(V)	
Unit cell size	2.9µm(H) × 2.9µm(V)	
Imaging system	RGB primary color Bayer arrangement mosaic filter on chip	
Synchronizing system	Internal	
Scanning system	Progressive	
Output size	1920x1080, 1280x720, 640x480, 320x240	
Max. frame rate	60 fps	
Video compression	MJPEG, YUY2	
Video output	USB Video Class (Compatible)	
Resolution (H)	More than 900 (Center)	
Minimum illumination	0.3 lx F2.0 (AGC ON=36dB, Shutter= OFF) 0.07 lx F2.0 (AGC ON=36dB, Shutter=1/7.5 sec.)	
S/N	-	
Function settings	Camera Viewer	
AE mode	Fixed	1/15, 1/7.5, 1/4 sec.
	EI	1/30, 1/60, 1/120, 1/250, 1/500, 1/1000, 1/2000, 1/4000, 1/8000 sec.
White balance	ATW, MWB	1/30 - 1/8000 sec.
	AGC	0 - 36dB
MGC	0 - 72dB (1dB step)	
Gamma characteristics	γ=USER (Level adjustable)	
Noise reduction	-	
Wide dynamic range	-	
Lens iris	-	
Back light compensation	BLC	
White blemish correction	-	
Sharpness	Level adjustable	
Defog	-	
Digital zoom	x1, x1.38, x2.25 *1, x1, x1.2, x1.5 *2	
Privacy mask	-	
Mirror image	-	
Freeze	-	
Motion detection	-	
Neg.image	-	
Interface	USB2.0 Type-C	
Power supply	USB +5V	
Power consumption	0.8W (160mA)	
Operating / Storage Temperature	-10 - +50°C / -30 - +70°C	
Operating / Storage Humidity	95% RH or less (Without condensation)	
Lens mount	M12 P=0.5	
Standard lens	G2.5:M2520BC-12(F2.5 F2.0) G3.6:M3620BC-12 (F3.6 F2.0)	
Cable length	1.0m (Max. 3.0m)	
Weight	G2.5: Approx. 105g G3.6: Approx. 105g	
Accessories	-	
Recommended System Specifications	CPU	Intel® Core™ I Series
	RAM	2GB or larger
	Others	USB2.0 Port, 1920x1080 or better resolution display
Operation Confirmed OS	Windows 10 32bit/64bit, Windows 11, Android 4.0 or later	

\*1: Output format: 640x480 \*2: Output format: 1280x720

Network

SDI

USB

Analog Color

Analog Monochrome

Options

Other

# WAT-05U2M 1/2.8" USB2.0 Full HD Wearable Camera

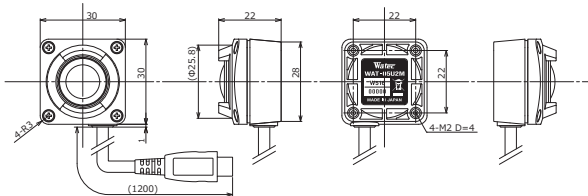
Compact water-resistant camera (Dimensions: H30×W30×D22mm)



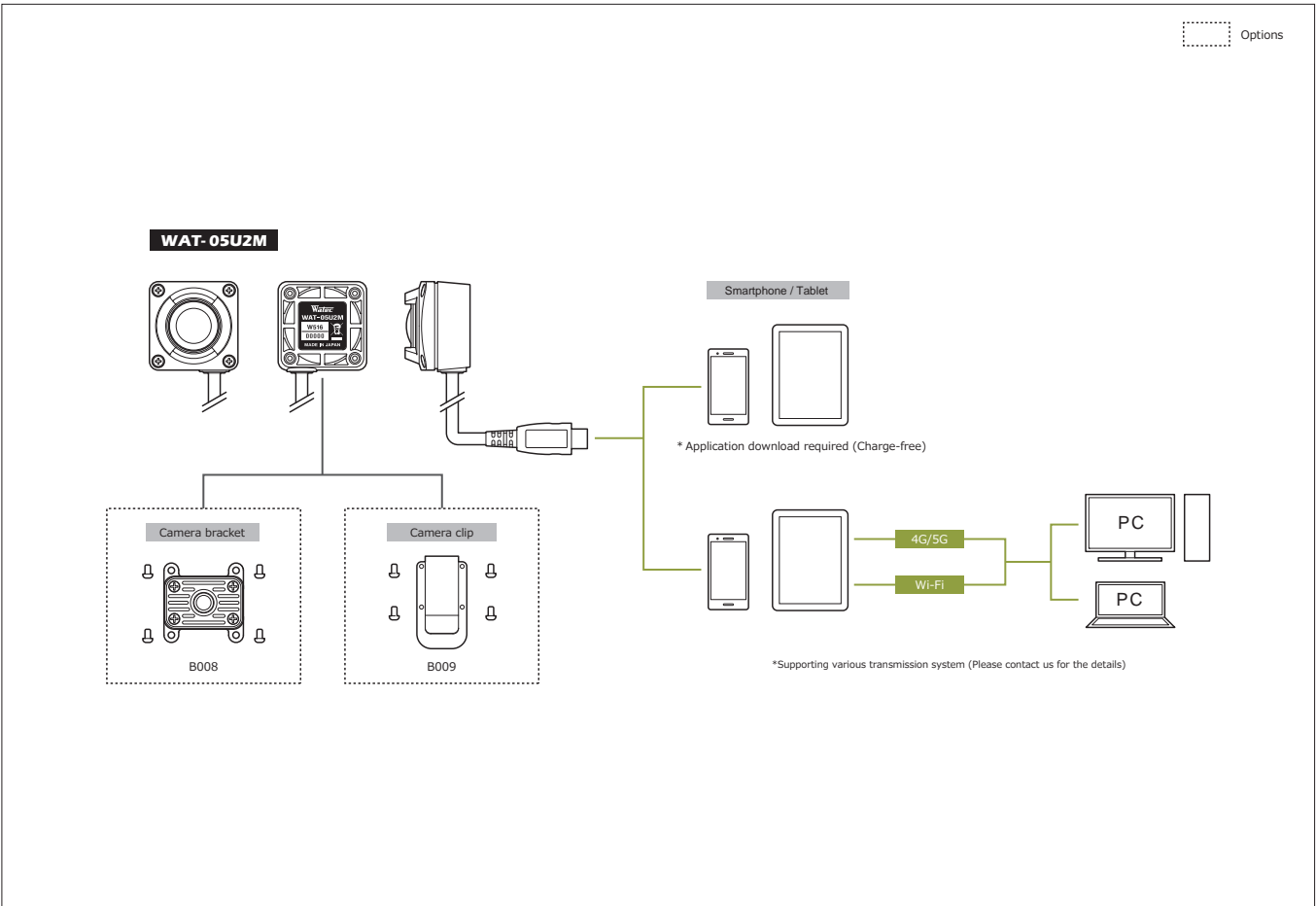
### Key features

- Adopted the 180 degree wide angle lens
- The position of the cable is selectable in 4 dimensions (top, bottom, left and right) depends on the application and installation (Std. position: bottom)
- Enable the live video transmission via the smartphone or tablet by its Wi-Fi or 4G/5G
- Water-resistant design (IPX7 equivalent) enables outdoor use.
- Standard USB connector is Micro-B, but Type-A version of "WAT-05U2M Type-A" and Type-C version of "WAT-05U2M Type-C" are also available.

### Dimensions



### System diagram



### Specifications

Pick-up element	1/2.8 inch BSI CMOS image sensor	
Number of effective pixels	1945(H) × 1097(V)	
Unit cell size	2.9µm(H) × 2.9µm(V)	
Imaging system	RGB primary color bayer arrangement mosaic filters on chip	
Synchronizing system	Internal	
Scanning system	Progressive	
Output size	1920×1080, 1280×720, 640×480, 320×240	
Max. frame rate	30 fps	
Video compression	MJPG, YUY2	
Video output	USB Video Class (Compatible)	
Minimum illumination	0.3 lx F2.0 (AGC ON=36dB, Shutter=OFF)	
	0.07 lx F2.0 (AGC ON=36dB, Shutter=1/7.5 sec.)	
S/N	-	
Function settings	Camera Viewer	
AE mode	Fixed	1/15, 1/7.5, 1/4 sec.
		1/30, 1/60, 1/120, 1/250, 1/500, 1/1000, 1/2000, 1/4000, 1/8000 sec.
	EI	1/30 - 1/8000 sec.
		1/7.5 - 1/8000 sec.
White balance	ATW, MWB	
AGC	ON	0 - 36dB
	OFF	-
MGC	0 - 72dB (1dB step)	
Gamma characteristics	γ=USER (Level adjustable)	
Noise reduction	-	
Wide dynamic range	-	
Lens iris	-	
Back light compensation	BLC	
White blemish correction	-	
Sharpness	Level adjustable	
Defog	-	
Digital zoom	×1, ×1.38, ×2.25 *1	×1, ×1.2, ×1.5 *2
Privacy mask	-	
Mirror image	-	
Freeze	-	
Motion detection	-	
Neg.image	-	
Interface	USB 2.0 Micro-B	
Power supply	USB +5V	
Power consumption	0.85W (170mA)	
Operating / Storage Temperature	-10 ~ +50°C / -30 ~ +60°C	
Operating / Storage Humidity	95% RH or less (Without condensation)	
Standard lens	M1720BC-12 (f1.7 F2.0)	
Cable length	1.2m (Max. 3.0m)	
Weight	Approx. 45g	
Accessories	-	
Recommended System Specifications	CPU	Intel® Core TM I Series
	RAM	3GB or larger
	Others	USB2.0 Port, 1920×1080 or better resolution display
Operation Confirmed OS	Windows 7 32bit/64bit, Windows 8 32bit/64bit, Windows 8.1 32bit/64bit,	
	Windows 10 32bit/64bit, Windows 11, Android 4.0 or newer	

\*1: Output format: 640x480 \*2: Output format: 1280x720

# Waterproof USB 2.0 Full HD Wearable Camera

Wearable camera with a high durable aluminum housing

**WAT-06U2D/AL** (Color)

**WAT-07U2D/AL** (Monochrome)



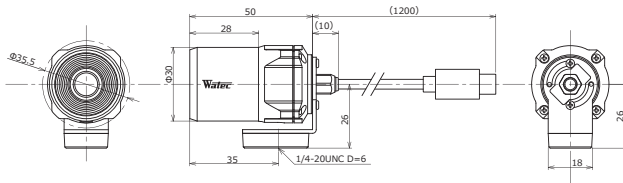
\*The photo shows the Type-C version.  
**\*No CE & FCC**

### Key features

- USB Video Class & USB Bus Power (plug & play)
- HD (Max. frame rate 60fps)
- Enable the live video transmission via the smartphone or tablet by its Wi-Fi or 4G/5G
- Waterproof design (IPX7 equivalent) enables outdoor use. \*Not guaranteed to use underwater.
- Standard USB connector is Micro-B, but Type-A version of "WAT-06U2D/AL Type-A" and Type-C version of "WAT-06U2D/AL Type-C" are also available. (same for WAT-07U2D/AL)

### Dimensions

\*The drawing below is for Type-C version.



# Water-resistant USB 2.0 Full HD Wearable Camera

Enable the live video transmission via the smartphone or tablet by its Wi-Fi or 4G/5G

Standard model of wearable camera

High sensitivity wearable camera

**WAT-06U2D** (Color)

**WAT-07U2D** (Monochrome)



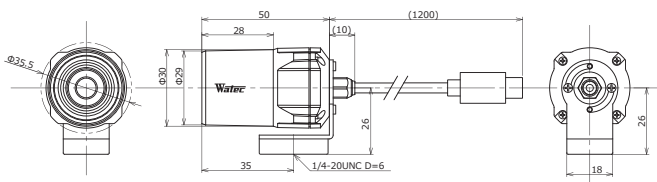
\*The photo shows the Type-C version.  
**\*No CE & FCC**

### Key features

- USB Video Class & USB Bus Power (plug & play)
- HD (Max. frame rate 30fps)
- Water-resistant design (IPX7 equivalent) enables outdoor use.
- Standard USB connector is Micro-B, but Type-A version of "WAT-06U2D Type-A" and Type-C version of "WAT-06U2D Type-C" are also available. (same for WAT-07U2D)
- Compared to the previous model (WAT-02U2D), the resolution is 1.3 times higher and the sensitivity is 3.5 times higher.

### Dimensions

\*The drawing below is for Type-C version.



### Specifications

Model	WAT-06U2D/AL	WAT-07U2D/AL
Pick-up element	1/2.8 inch BSI CMOS image sensor	
Number of effective pixels	1945(H) × 1097(V)	
Unit cell size	2.9µm(H) × 2.9µm(V)	
Imaging system	RGB primary color bayer arrangement mosaic filters on chip	—
Synchronizing system	Internal	
Scanning system	Progressive	
Output size	1920x1080, 1280x720, 640x480, 320x240	
Max. frame rate	60 fps	
Video compression	MJPEG, YUY2	
Video output	USB Video Class (Compatible)	
Resolution (H)	More than 900 (Center)	More than 800 (Center)
Minimum illumination	0.3 lx F2.0 (AGC ON=36dB, Shutter=OFF)	0.004 lx F2.0 (AGC ON=36dB, Shutter=OFF)
	0.07 lx F2.0 (AGC ON=36dB, Shutter=1/7.5 sec.)	0.001 lx F2.0 (AGC ON=36dB, Shutter=1/7.5 sec.)
S/N	—	
Function settings	Camera Viewer	
AE mode	Fixed	1/15, 1/7.5, 1/4 sec.
	EI	1/30, 1/60, 1/120, 1/250, 1/500, 1/1000, 1/2000, 1/4000, 1/8000 sec.
White balance	ATW, MWB	—
	AGC	0 - 36dB
MGC	ON	—
	OFF	—
Gamma characteristics	γUSER (Level adjustable)	
Noise reduction	—	
Wide dynamic range	—	
Lens iris	—	
Back light compensation	BLC	
White blemish correction	—	
Sharpness	Level adjustable	
Defog	—	
Digital zoom	x1, x1.38, x2.25 *1	x1, x1.2, x1.5 *2
Privacy mask	—	
Mirror image	—	
Freeze	—	
Motion detection	—	
Neg.image	—	
Interface	USB 2.0 Micro-B	
Power supply	USB +5V	
Power consumption	0.65W (130mA)	
Operating / Storage Temperature	-10 - +50°C / -30 - +70°C	
Operating / Storage Humidity	95% RH or less (Without condensation)	
Standard lens	M3620BC-12 (f3.6 F2.0)	
Cable length	1.2m (Max.3.0m)	
Weight	Approx. 98g	
Accessories	—	
Recommended System Specifications	CPU	Intel® Core TM i Series
	RAM	2GB or larger
	Others	USB2.0 Port, 1920×1080 or better resolution display
Operation Confirmed OS	Windows 10 32bit/64bit, Windows 11, Android 4.0 or newer	

\*1: Output format: 640x480 \*2: Output format: 1280x720

### Specifications

Model	WAT-06U2D	WAT-07U2D
Pick-up element	1/2.8 inch BSI CMOS image sensor	
Number of effective pixels	1945(H) × 1097(V)	
Unit cell size	2.9µm(H) × 2.9µm(V)	
Imaging system	RGB primary color bayer arrangement mosaic filters on chip	—
Synchronizing system	Internal	
Scanning system	Progressive	
Output size	1920x1080, 1280x720, 640x480, 320x240	
Max. frame rate	30 fps	
Video compression	MJPEG, YUY2	
Video output	USB Video Class (Compatible)	
Resolution (H)	More than 900 (Center)	More than 800 (Center)
Minimum illumination	0.3 lx F2.0 (AGC ON=36dB, Shutter=OFF)	0.004 lx F2.0 (AGC ON=36dB, Shutter=OFF)
	0.07 lx F2.0 (AGC ON=36dB, Shutter=1/7.5 sec.)	0.001 lx F2.0 (AGC ON=36dB, Shutter=1/7.5 sec.)
S/N	—	
Function settings	Camera Viewer	
AE mode	Fixed	1/15, 1/7.5, 1/4 sec.
	EI	1/30, 1/60, 1/120, 1/250, 1/500, 1/1000, 1/2000, 1/4000, 1/8000 sec.
White balance	ATW, MWB	—
	AGC	0 - 36dB
MGC	ON	—
	OFF	—
Gamma characteristics	γUSER (Level adjustable)	
Noise reduction	—	
Wide dynamic range	—	
Lens iris	—	
Back light compensation	BLC	
White blemish correction	—	
Sharpness	Level adjustable	
Defog	—	
Digital zoom	x1, x1.38, x2.25 *1	x1, x1.2, x1.5 *2
Privacy mask	—	
Mirror image	—	
Freeze	—	
Motion detection	—	
Neg.image	—	
Interface	USB 2.0 Micro-B	
Power supply	USB +5V	
Power consumption	0.65W (130mA)	
Operating / Storage Temperature	-10 - +50°C / -30 - +70°C	
Operating / Storage Humidity	95% RH or less (Without condensation)	
Standard lens	M3620BC-12 (f3.6 F2.0)	
Cable length	1.2m (Max.3.0m)	
Weight	Approx. 85g	
Accessories	—	
Recommended System Specifications	CPU	Intel® Core TM i Series
	RAM	2GB or larger
	Others	USB2.0 Port, 1920×1080 or better resolution display
Operation Confirmed OS	Windows 10 32bit/64bit, Windows 11, Android 4.0 or newer	

\*1: Output format: 640x480 \*2: Output format: 1280x720

# WAT-03U2D 1/3" High Sensitivity USB2.0 HD Water-Resistant Camera

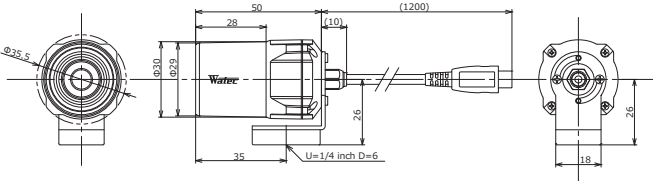
Enable the live video transmission via the smartphone or tablet by its Wi-Fi or 4G/5G



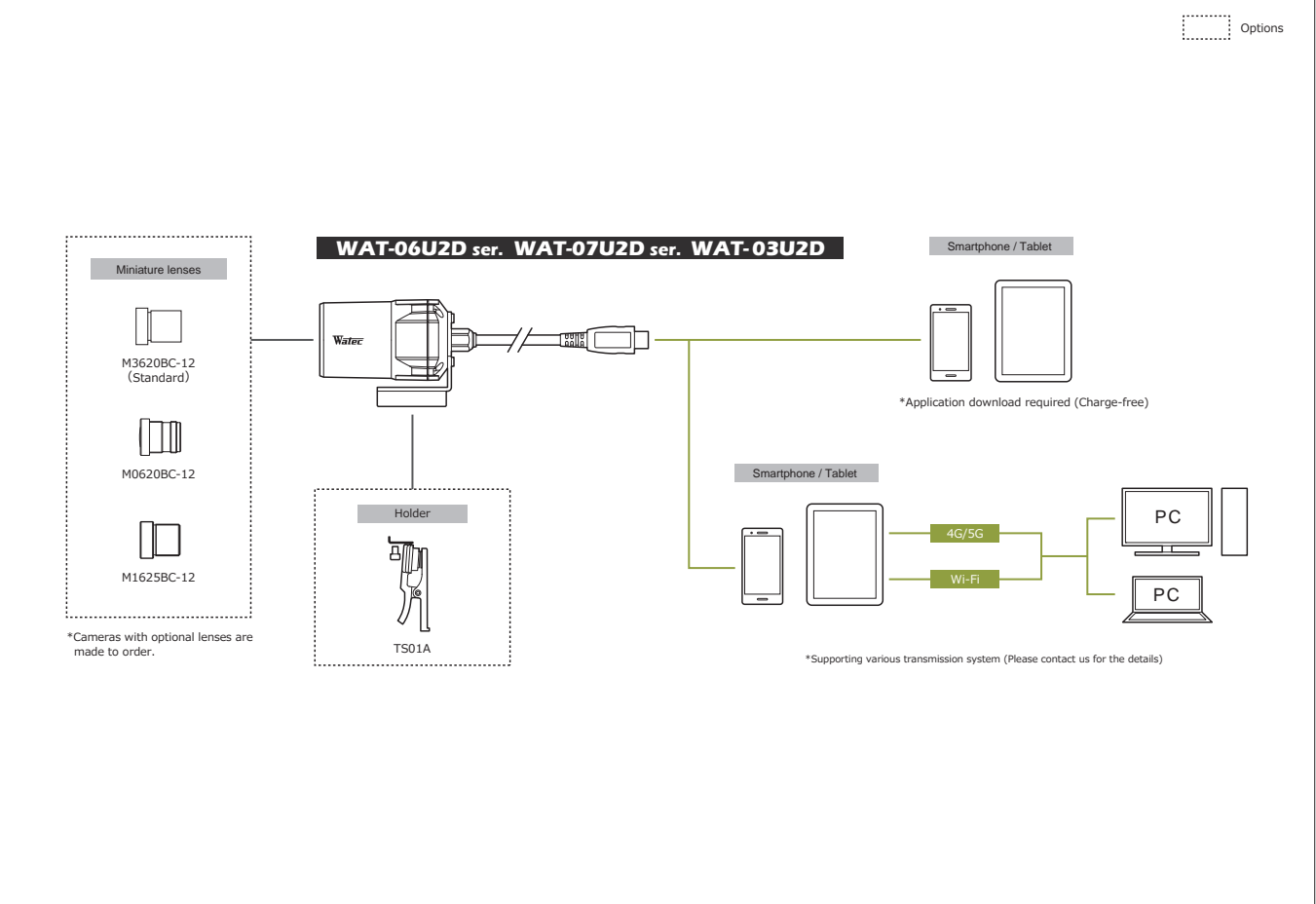
### Key features

- High Sensitivity 1.3 Mega pixel CMOS sensor
- Min. illumination 0.04 lx F2.0 (AGC ON=42dB, Shutter=OFF)  
0.01 lx F2.0 (AGC ON=42dB, Shutter=1/7.5 sec.)
- Frame rate : 30fps (HD), 60fps (VGA)
- Water-resistant design (IPX7 equivalent) enables outdoor use.
- Standard USB connector is Micro-B, but Type-A version of "WAT-03U2D Type-A" and Type-C version of "WAT-03U2D Type-C" are also available.

### Dimensions



### System diagram



### Specifications

Pick-up element	1/3 inch CMOS image sensor	
Number of effective pixels	1305(H) × 977(V)	
Unit cell size	3.75µm(H) × 3.75µm(V)	
Imaging system	RGB primary color bayer arrangement mosaic filters on chip	
Synchronizing system	Internal	
Scanning system	Progressive	
Output size	1280×960, 1280×720, 640×480, 320×240	
Max. frame rate	60 fps	
Video compression	MJPG, YUY2	
Video output	USB Video Class (Compatible)	
Minimum illumination	0.04 lx F2.0 (AGC ON=42dB, Shutter=OFF)	
	0.01 lx F2.0 (AGC ON=42dB, Shutter=1/7.5 sec.)	
S/N	-	
Function settings	Camera Viewer	
AE mode	Fixed	1/15, 1/7.5, 1/4, 1/2, 1, 2 sec.
	EI	1/30, 1/60, 1/120, 1/250, 1/500, 1/1000, 1/2000, 1/4000, 1/8000 sec.
		1/30 - 1/8000 sec.
White balance	ATW, MWB	
AGC	ON	0 - 42dB
	OFF	-
MGC	0 - 72dB (1dB step)	
Gamma characteristics	γ=USER (Level adjustable)	
Noise reduction	-	
Wide dynamic range	-	
Lens iris	-	
Back light compensation	BLC	
White blemish correction	-	
Sharpness	Level adjustable	
Defog	-	
Digital zoom	-	
Privacy mask	-	
Mirror image	-	
Freeze	-	
Motion detection	-	
Neg.image	-	
Interface	USB 2.0 Micro-B	
Power supply	USB +5V	
Power consumption	0.75W (150mA)	
Operating / Storage Temperature	-10 - +50°C / -30 - +70°C	
Operating / Storage Humidity	95% RH or less (Without condensation)	
Standard lens	M3620BC-12 (f3.6 F2.0)	
Cable length	1.2m (Max. 3.0m)	
Weight	Approx. 85g	
Accessories	-	
Recommended System Specifications	CPU	Intel® Core TM i Series
	RAM	2GB or larger
	Others	USB2.0 Port, 1920×1080 or better resolution display
Operation Confirmed OS	Windows 7 32bit/64bit, Windows 8 32bit/64bit, Windows 8.1 32bit/64bit,	
	Windows 10 32bit/64bit, Android 4.0 or newer	

# WAT-2500

1/2.8" Multi-function Compact High Sensitivity Analog Color Camera

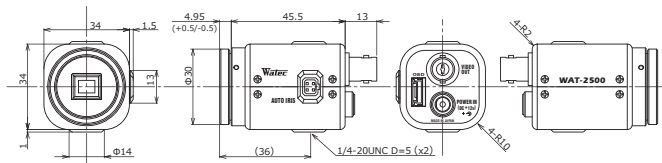
Typical design model with multi-functions in a small body



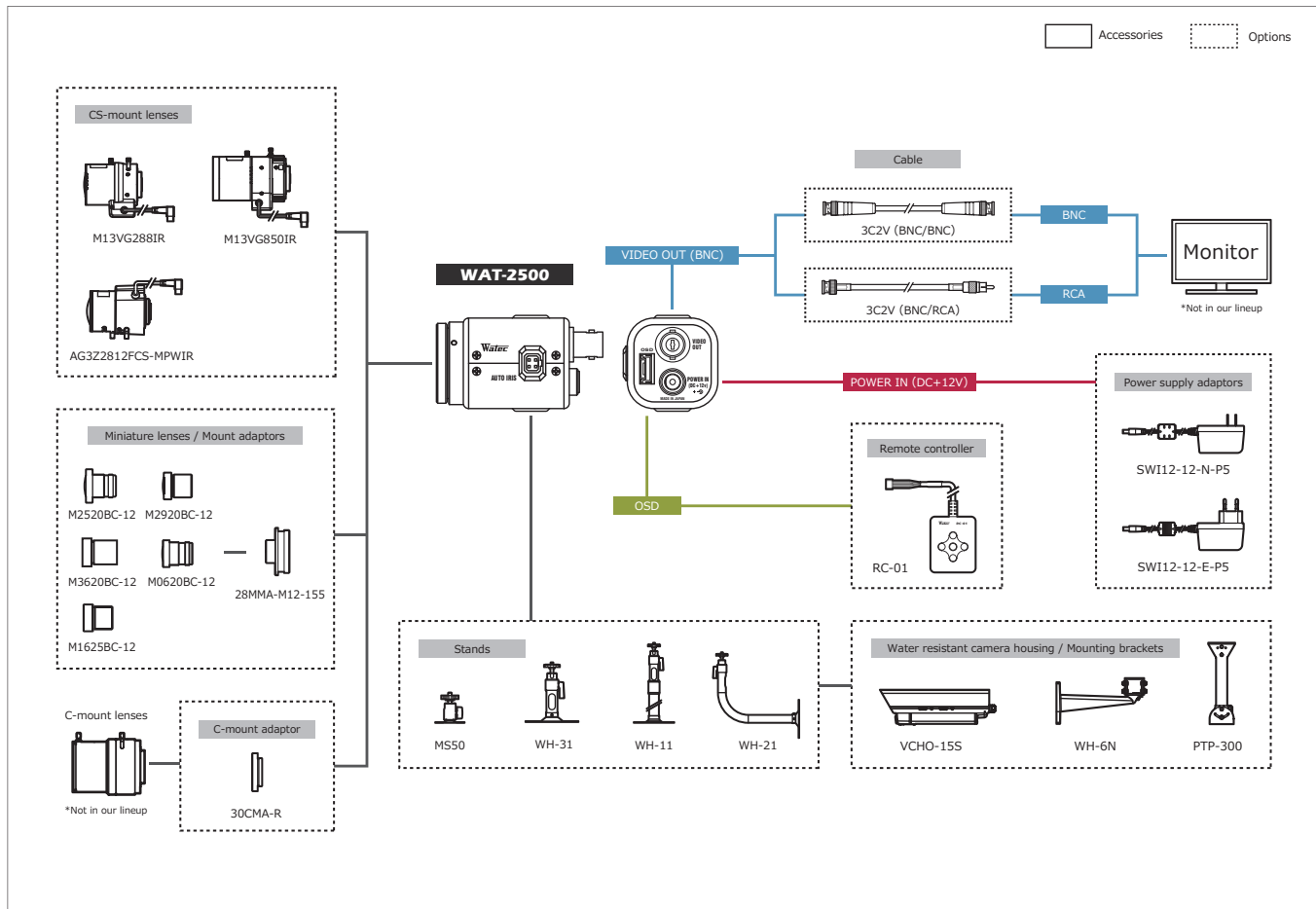
### Key features

- 1/2.8-inch BSI CMOS image sensor with high sensitivity
- Advanced setting available by OSD (On Screen Display) through an optional remote controller
- Min. illumination 0.0065 lx F1.2 (AGC HIGH=72dB, Shutter=OFF)  
0.0004 lx F1.2 (AGC HIGH=72dB, Shutter=x15)

### Dimensions



### System diagram



### Specifications

Video standard		NTSC	PAL
Pick-up element		1/2.8 inch BSI CMOS image sensor	
Number of effective pixels		1945(H) x 1097(V) *1	
Unit cell size		2.9µm(H) x 2.9µm(V)	
Imaging system		RGB primary color bayer arrangement mosaic filter on chip	
Synchronizing system		Internal	
Scanning system		Progressive	
Video output		Composite: 1.0 V(p-p) 75Ω (Unbalanced)	
Setup level		7.5IRE	0IRE
Resolution (H)		More than 570TVL (Center)	
Minimum illumination		0.0065 lx F1.2 (AGC HIGH=72dB, Shutter=OFF) 0.0004 lx F1.2 (AGC HIGH=72dB, Shutter=x15)	
S/N		More than 45dB (AGC OFF=0dB, γ=1.0)	
Function settings		OSD : Remote controller	
AE mode	Fixed	x2, x3, x4, x5, x6, x7, x8, x9, x10, x12, x15 (frame)	
		1/30, 1/60, 1/120, 1/180, 1/240, 1/300 sec.	1/25, 1/50, 1/100, 1/150, 1/200, 1/250 sec.
	EI	1/500, 1/1000, 1/2000, 1/5000, 1/10000 sec.	1/25 - 1/10000 sec.
		x15 - 1/10000 sec.	
White balance		ATW, PWB, MWB	
AGC	ON	0 - 36dB (LOW), 0 - 50dB (MID), 0 - 72dB (HIGH)	
	OFF	0dB	
MGC		0 - 72dB (5dB step)	
Day/Night		-	
Gamma characteristics		γ=USER (Level adjustable)	
Video level		-	
Noise reduction		3DNR OFF/ON Level adjustable, 2DNR OFF/ON Level adjustable, 3D+2DNR ON Level adjustable	
Wide dynamic range		WDR OFF/ON Level adjustable, D-WDR OFF/ON Level adjustable	
Lens iris		DC	
Back light compensation		BLC, HSBLC	
White blemish correction		Up to 2046 pixels	
Sharpness		OFF/ON Level adjustable	
Defog		OFF/ON Level adjustable	
Digital zoom		ZOOM (x1.01 - x8.00), PAN/TILT	
Privacy mask		8 masks	
Mirror image		OFF, V-FLIP, H-FLIP, HV-FLIP	
Freeze		OFF/ON	
Motion detection		-	
Neg.image		OFF/ON	
Interface		BNC (Composite video), Power in, Remote controller (RC-01), Auto iris	
Power supply		DC+12V±10%	
Power consumption		2.04W (170mA)	
Operating / Storage temperature		-10 - +50°C / -30 - +70°C	
Operating / Storage humidity		95%RH or less (Without condensation)	
Lens mount		CS mount (Back focus adjustable)	
Weight		Approx. 78g	
Accessories		WPDC12 (DC plug), Hex. wrench	

\*1: The output is cut out according to the video standard.

Network

SDI

USB

Analog Color

Analog Monochrome

Options

Other

# WAT-1200CS

1/3.2" High Sensitivity Miniature Camera with Day/Night

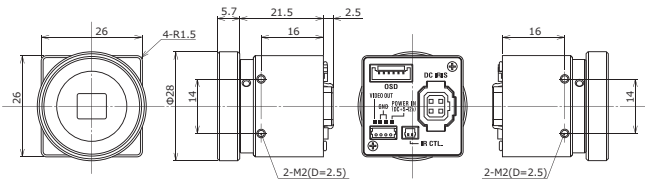
Day/Night camera for general surveillance



### Key features

- High sensitivity min. illumination 0.002 lx F1.2 (AGC ON=54dB, Shutter=OFF)
- Ultra-compact design only 26 x 26 x 30 mm
- Wide dynamic range, ICR Mechaless Day/Night function
- A dual-band pass filter allows the ability to view a scene with 850nm IR illumination at night
- \*Advanced setting available by OSD (On Screen Display) through an optional remote controller

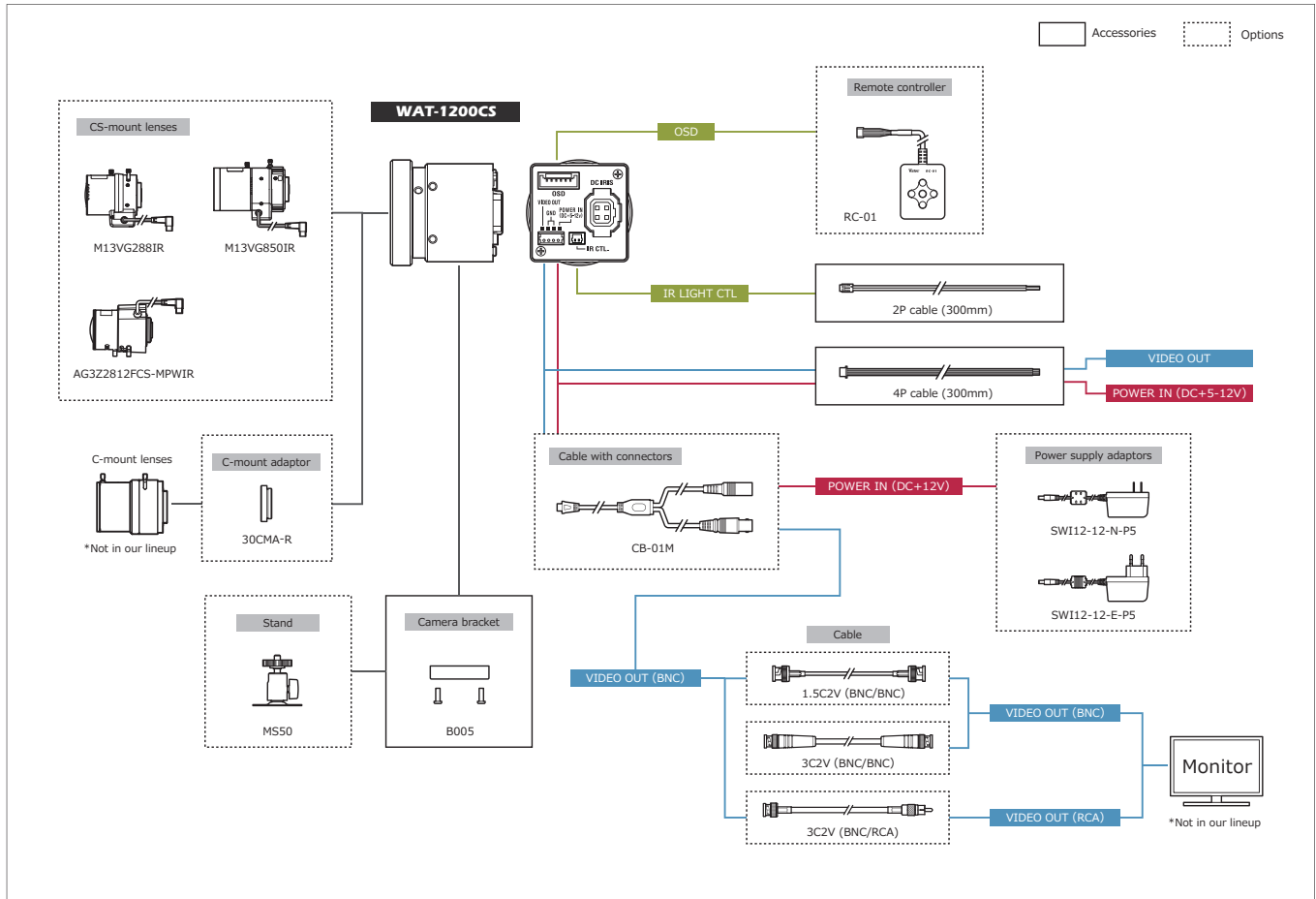
### Dimensions



### Specifications

		NTSC	PAL
Video standard		NTSC	PAL
Pick-up element		1/3.2 inch BSI CMOS image sensor	
Number of effective pixels		1280(H) x 960(V)	1280(H) x 924(V)
Unit cell size		3.5µm(H) x 3.5µm(V)	
Imaging system		RGB+W array mosaic filters on chip	
Synchronizing system		Internal	
Scanning system		Progressive	
Video output		Composite: 1.0 V(p-p) 75Ω (Unbalanced)	
Resolution (H)		More than 750TVL (Center)	
Minimum illumination		0.002 lx F1.2 (AGC ON=54dB, Shutter=OFF)	
S/N		More than 55dB (AGC OFF=0dB, γ=1.0)	
Function settings		OSD : Remote controller	
AE mode	Fixed	1/60 sec.	1/50 sec.
		1/100, 1/120, 1/125, 1/250, 1/500, 1/1000, 1/2000, 1/4000, 1/8000, 1/10000, 1/20000, 1/50000, 1/100000 sec.	
	EI	1/60 - 1/100000 sec.	1/50 - 1/100000 sec.
White balance		ATW, AWB, PWB, MWB, PRESET (5100K, 6300K)	
AGC	ON	0 - 54dB	
	OFF	0dB	
MGC		0 - 54dB (6dB step)	
Day/Night		ICR mechaless Auto, Manual	
Gamma characteristics		γ=0.45	
Video level		Adjustable	
Noise reduction		2DNR OFF/ON Level adjustable	
Wide dynamic range		WDR OFF/ON Level adjustable, D-WDR OFF/ON Level adjustable	
Lens iris		DC	
Back light compensation		BLC, HSBLC	
White blemish correction		-	
Sharpness		Level adjustable	
Defog		OFF/ON Level adjustable	
Digital zoom		-	
Privacy mask		16 masks	
Mirror image		OFF, V-FLIP, H-FLIP, HV-FLIP	
Freeze		-	
Motion detection		-	
Neg. image		-	
Interface		4P connector (Composite Video, Power in), Auto iris, 2P connector (IR light ctl), Remote controller (RC-01)	
Power supply		DC+5V - 12V	
Power consumption		0.6W/120mA (DC+5V), 0.72W/60mA (DC+12V)	
Operating temperature		-10 - +50°C	
Storage temperature		-30 - +70°C	
Operating / Storage humidity		95% RH or less (Without condensation)	
Lens mount		CS mount	
Weight		Approx. 22g	
Accessories		4P cable, 2P cable, Hex. wrench, B005 (Camera bracket)	

### System diagram



# WAT-240E (G3.8) 1/4"Miniature Camera

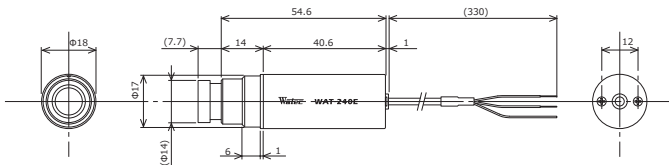
Compact cylindrical camera with Built-in lens



### Key features

- Resolution 480TVL
- Versatile use for limited space, general surveillance, embedded system and part of image processing system
- Various Optional M12 lenses available \*Glass lenses and pinhole lens are not interchangeable

### Dimensions



### Specifications

Video standard		NTSC	PAL
Pick-up element		1/4 inch CMOS image sensor	
Number of effective pixels		648(H) x 488(V)	
Unit cell size		5.6μm(H) x 5.6μm(V)	
Imaging system		RGB primary color bayer arrangement mosaic filters on chip	
Synchronizing system		Internal	
Scanning system		Progressive	
Video output		Composite: 1.0 V(p-p) 75Ω (Unbalanced)	
Resolution (H)		More than 480TVL (Center)	
Minimum illumination		0.3 lx F2.0 (AGC ON=42dB, Shutter=OFF)	
S/N		More than 52dB (AGC OFF=0dB, γ=1.0)	
Function settings		-	
AE mode	Fixed	-	
	EI	1/60 - 1/100000 sec.	1/50 - 1/100000 sec.
White balance		ATW	
AGC	ON	0 - 42dB	
	OFF	-	
MGC		-	
Day/Night		-	
Gamma characteristics		γ±0.45	
Video level		85IRE	
Noise reduction		-	
Wide dynamic range		-	
Lens iris		-	
Back light compensation		BLC	
White blemish correction		-	
Sharpness		-	
Defog		-	
Digital zoom		-	
Privacy mask		-	
Mirror image		-	
Freeze		-	
Motion detection		-	
Neg.image		-	
Interface		3P cable (Composite Video, Power in)	
Power supply		DC+5V - 6V	
Power consumption		0.66W/110mA (DC+6V)	
Operating temperature		-10 - +50°C	
Storage temperature		-30 - +70°C	
Operating / Storage humidity		95% RH or less (Without condensation)	
Lens mount		M12 P=0.5	
Standard lens		3820BC-12 (f3.8 F2.0)	
Cable length		330mm	
Weight		Approx. 23g	
Accessories		Ring holder	

# WAT-240E/CB (G3.8) 1/4"Miniature Camera

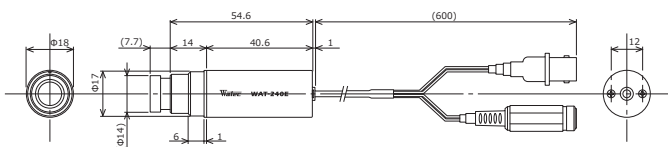
Compact cylindrical camera with Built-in lens & BNC output



### Key features

- Resolution 480TVL
- Versatile use for limited space, general surveillance, embedded system and part of image processing system
- Various Optional M12 lenses available \*Glass lenses and pinhole lens are not interchangeable

### Dimensions



### Specifications

Video standard		NTSC	PAL
Pick-up element		1/4 inch CMOS image sensor	
Number of effective pixels		648(H) x 488(V)	
Unit cell size		5.6μm(H) x 5.6μm(V)	
Imaging system		RGB primary color bayer arrangement mosaic filters on chip	
Synchronizing system		Internal	
Scanning system		Progressive	
Video output		Composite: 1.0 V(p-p) 75Ω (Unbalanced)	
Resolution (H)		More than 480TVL (Center)	
Minimum illumination		0.3 lx F2.0 (AGC ON=42dB, Shutter=OFF)	
S/N		More than 52dB (AGC OFF=0dB, γ=1.0)	
Function settings		-	
AE mode	Fixed	-	
	EI	1/60 - 1/100000 sec.	1/50 - 1/100000 sec.
White balance		ATW	
AGC	ON	0 - 42dB	
	OFF	-	
MGC		-	
Day/Night		-	
Gamma characteristics		γ±0.45	
Video level		85IRE	
Noise reduction		-	
Wide dynamic range		-	
Lens iris		-	
Back light compensation		BLC	
White blemish correction		-	
Sharpness		-	
Defog		-	
Digital zoom		-	
Privacy mask		-	
Mirror image		-	
Freeze		-	
Motion detection		-	
Neg.image		-	
Interface		BNC (Composite Video), Power in	
Power supply		DC+5V - 6V	
Power consumption		0.66W/110mA (DC+6V)	
Operating temperature		-10 - +50°C	
Storage temperature		-30 - +70°C	
Operating / Storage humidity		95% RH or less (Without condensation)	
Lens mount		M12 P=0.5	
Standard lens		3820BC-12 (f3.8 F2.0)	
Cable length		600mm	
Weight		Approx. 33g	
Accessories		Ring holder	

## WAT-240E (P3.7) 1/4" Miniature Camera

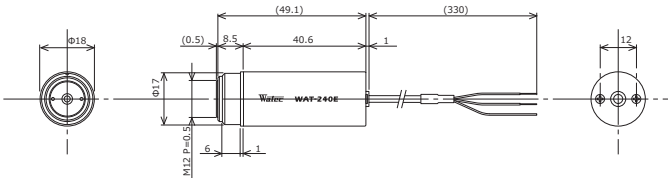
Compact cylindrical camera with Built-in lens



### Key features

- Resolution 480TVL
  - Versatile use for limited space, general surveillance, embedded system and part of image processing system
- \*Glass lenses and pinhole lens are not interchangeable

### Dimensions



## WAT-240E/CB (P3.7) 1/4" Miniature Camera

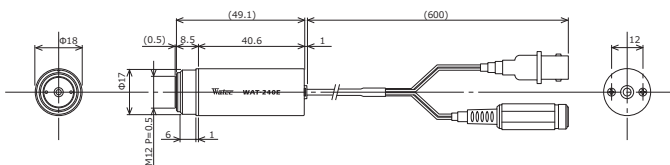
Compact cylindrical camera with Built-in lens & BNC output



### Key features

- Resolution 480TVL
  - Versatile use for limited space, general surveillance, embedded system and part of image processing system
- \*Glass lenses and pinhole lens are not interchangeable

### Dimensions



### Specifications

Video standard		NTSC	PAL
Pick-up element		1/4 inch CMOS image sensor	
Number of effective pixels		648(H) x 488(V)	
Unit cell size		5.6μm(H) x 5.6μm(V)	
Imaging system		RGB primary color bayer arrangement mosaic filters on chip	
Synchronizing system		Internal	
Scanning system		Progressive	
Video output		Composite: 1.0 V(p-p) 75Ω (Unbalanced)	
Resolution (H)		More than 480TVL (Center)	
Minimum illumination		0.3 lx F2.0 (AGC ON=42dB, Shutter=OFF)	
S/N		More than 52dB (AGC OFF=0dB, γ=1.0)	
Function settings		-	
AE mode	Fixed	-	
	EI	1/60 - 1/100000 sec.	1/50 - 1/100000 sec.
White balance		ATW	
AGC	ON	0 - 42dB	
	OFF	-	
MGC		-	
Day/Night		-	
Gamma characteristics		γ±0.45	
Video level		85IRE	
Noise reduction		-	
Wide dynamic range		-	
Lens iris		-	
Back light compensation		BLC	
White blemish correction		-	
Sharpness		-	
Defog		-	
Digital zoom		-	
Privacy mask		-	
Mirror image		-	
Freeze		-	
Motion detection		-	
Neg.image		-	
Interface		3P cable (Composite Video, Power in)	
Power supply		DC+5V - 6V	
Power consumption		0.66W/110mA (DC+6V)	
Operating temperature		-10 - +50°C	
Storage temperature		-30 - +70°C	
Operating / Storage humidity		95% RH or less (Without condensation)	
Lens mount		M12 P=0.5	
Standard lens		3720B-12P(B) (F3.7 F2.0)	
Cable length		330mm	
Weight		Approx. 1.8g	
Accessories		Ring holder	

### Specifications

Video standard		NTSC	PAL
Pick-up element		1/4 inch CMOS image sensor	
Number of effective pixels		648(H) x 488(V)	
Unit cell size		5.6μm(H) x 5.6μm(V)	
Imaging system		RGB primary color bayer arrangement mosaic filters on chip	
Synchronizing system		Internal	
Scanning system		Progressive	
Video output		Composite: 1.0 V(p-p) 75Ω (Unbalanced)	
Resolution (H)		More than 480TVL (Center)	
Minimum illumination		0.3 lx F2.0 (AGC ON=42dB, Shutter=OFF)	
S/N		More than 52dB (AGC OFF=0dB, γ=1.0)	
Function settings		-	
AE mode	Fixed	-	
	EI	1/60 - 1/100000 sec.	1/50 - 1/100000 sec.
White balance		ATW	
AGC	ON	0 - 42dB	
	OFF	-	
MGC		-	
Day/Night		-	
Gamma characteristics		γ±0.45	
Video level		85IRE	
Noise reduction		-	
Wide dynamic range		-	
Lens iris		-	
Back light compensation		BLC	
White blemish correction		-	
Sharpness		-	
Defog		-	
Digital zoom		-	
Privacy mask		-	
Mirror image		-	
Freeze		-	
Motion detection		-	
Neg.image		-	
Interface		BNC (Composite Video), Power in	
Power supply		DC+5V - 6V	
Power consumption		0.66W/110mA (DC+6V)	
Operating temperature		-10 - +50°C	
Storage temperature		-30 - +70°C	
Operating / Storage humidity		95% RH or less (Without condensation)	
Lens mount		M12 P=0.5	
Standard lens		3720B-12P(B) (F3.7 F2.0)	
Cable length		600mm	
Weight		Approx. 2.8g	
Accessories		Ring holder	

# WAT-240E/FS (G3.8) 1/4" Miniature Camera

Function setting controllable WAT-240E

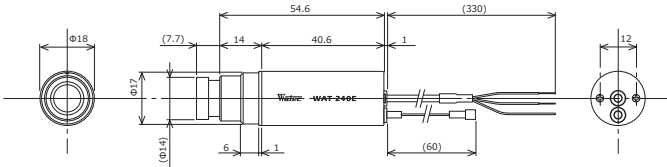


\* No CE & FCC

### Key features

- Advanced setting available through an optional AVM-USB2
- Versatile application for the miniature size and the shape
- Resolution 480 TVL
- Various lenses available (M12) \*Glass lenses and pinhole lens are not interchangeable
- Pinhole lens (P3.7) and BNC output (CB) versions available

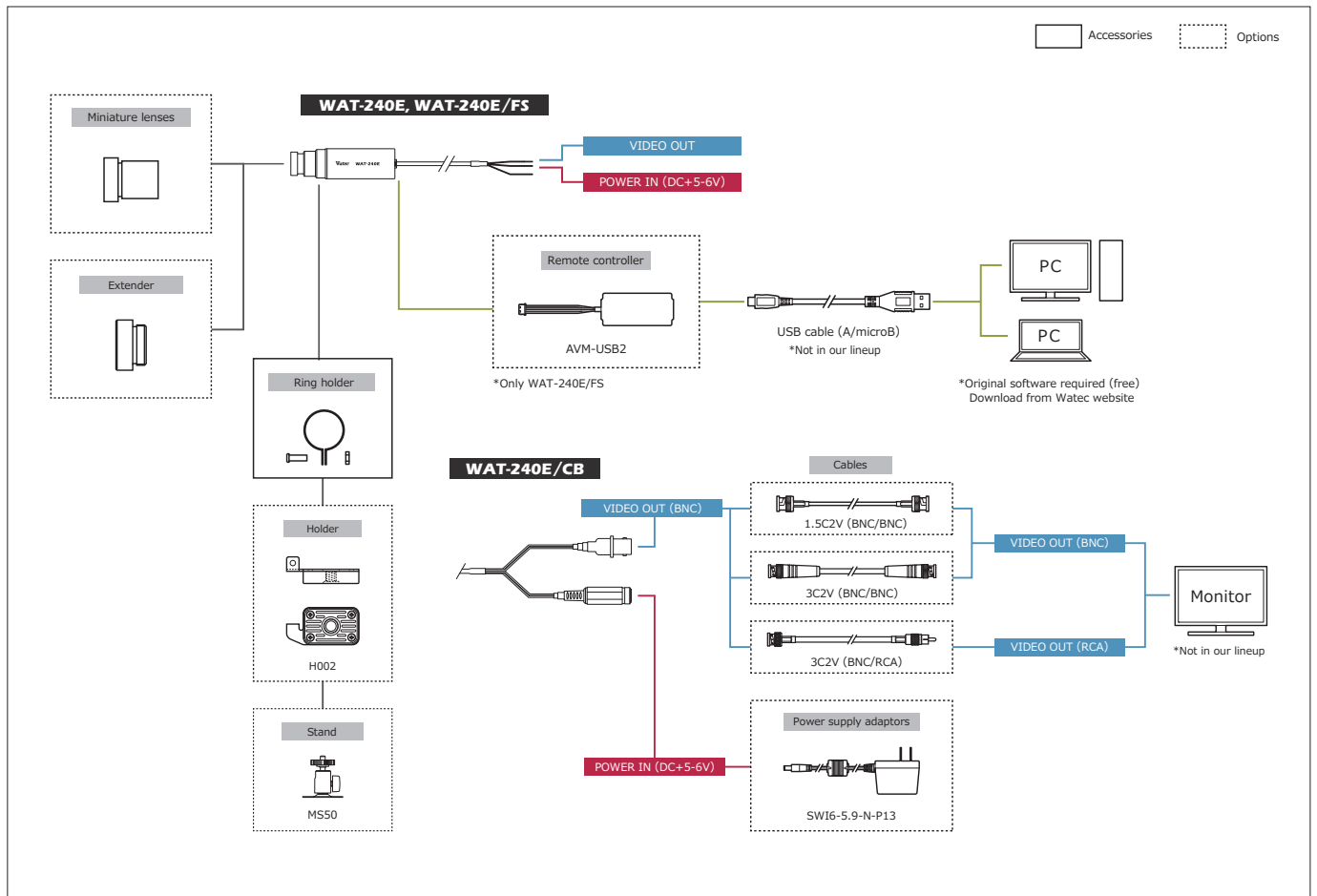
### Dimensions



### Specifications

		NTSC	PAL
Video standard		NTSC	PAL
Pick-up element		1/4 inch CMOS image sensor	
Number of effective pixels		648(H) × 488(V)	
Unit cell size		5.6μm(H) × 5.6μm(V)	
Imaging system		RGB primary color bayer arrangement mosaic filters on chip	
Synchronizing system		Internal	
Scanning system		Progressive	
Video output		Composite: 1.0 V (p-p) 75Ω (Unbalanced)	
Resolution (H)		More than 480TVL (Center)	
Minimum illumination		0.3 lx F2.0 (AGC ON=42dB, Shutter=OFF)	
S/N		More than 52dB (AGC OFF=0dB, γ=1.0)	
Function settings		Communication : USB (AVM-USB2)	
AE mode	Fixed	1/60, 1/100 sec.	1/50, 1/120 sec.
	EI	1/250, 1/500, 1/1000, 1/2500, 1/5000, 1/10000, 1/20000, 1/50000, 1/100000 sec.	1/50 - 1/100000 (Max.1/50 - 1/100000) sec.
White balance		ATW, MWB, PRESET (3200K, 4400K, 5100K, 8200K)	
AGC	ON	0 - 42dB (Max.0 - 42)	
	OFF	0dB	
MGC		0 - 42dB (1dB step)	
Day/Night		-	
Gamma characteristics		γ=0.45, 0.6, 1.0	
Video level		Adjustable	
Noise reduction		-	
Wide dynamic range		-	
Lens iris		-	
Back light compensation		BLC	
White blemish correction		-	
Sharpness		Level adjustable	
Defog		-	
Digital zoom		-	
Privacy mask		-	
Mirror image		OFF, V-FLIP, H-FLIP, HV-FLIP	
Freeze		-	
Motion detection		-	
Neg.image		-	
Interface		3P cable (Composite Video, Power in), 4P connector (Remote controller)	
Power supply		DC+5V - 6V	
Power consumption		0.66W/110mA (DC+6V)	
Operating temperature		-10 - +50°C	
Storage temperature		-30 - +70°C	
Operating / Storage humidity		95% RH or less (Without condensation)	
Lens mount		M12 P=0.5	
Standard lens		3820BC-12 (f3.8 F2.0)	
Cable length		3P cable : 330mm, 4P cable : 60mm	
Weight		Approx. 26g	
Accessories		Ring holder	

System diagram Representative connection example of the WAT-240E series



## WAT-1100MBD(G3.6) 1/3.2" High Sensitivity Miniature Board Day/Night Camera

Day/Night board camera for general surveillance

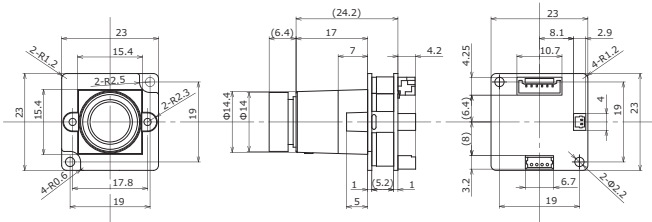


\*No CE & FCC

### Key features

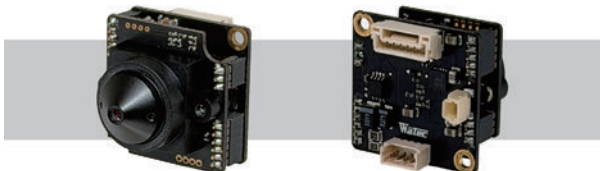
- High sensitivity min. illumination 0.005 lx F2.0 (AGC ON=54dB, Shutter=OFF)
  - Ultra-compact design only 23 x 23 x 35 mm
  - Wide dynamic range, ICR Mechaless Day/Night function
  - Advanced setting available by OSD (On Screen Display) through an optional remote controller
  - A dual-band pass filter allows the ability to view a scene with 850nm IR illumination at night
- \*Glass lenses and pinhole lens are not interchangeable

### Dimensions



## WAT-1100MBD(P3.7) 1/3.2" High Sensitivity Miniature Board Day/Night Camera

Day/Night board camera for general surveillance

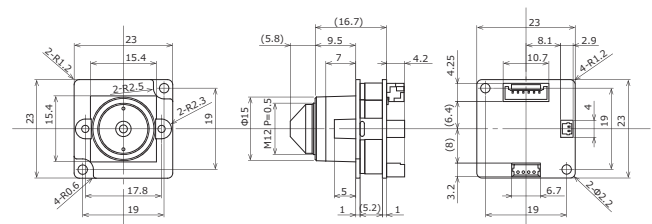


\*No CE & FCC

### Key features

- Ultra-compact design only 23 x 23 x 27 mm
  - Wide dynamic range, ICR Mechaless Day/Night function
  - Advanced setting available by OSD (On Screen Display) through an optional remote controller
  - A dual-band pass filter allows the ability to view a scene with 850nm IR illumination at night
- \*Glass lenses and pinhole lens are not interchangeable

### Dimensions



### Specifications

Video standard		NTSC	PAL
Pick-up element		1/3.2 inch BSI CMOS image sensor	
Number of effective pixels		1280(H) × 960(V)	1280(H) × 924(V)
Unit cell size		3.5μm(H) × 3.5μm(V)	
Imaging system		RGB+W array mosaic filters on chip	
Synchronizing system		Internal	
Scanning system		Progressive	
Video output		Composite: 1.0 V(p-p) 75Ω (Unbalanced)	
Resolution (H)		More than 750TVL (Center)	
Minimum illumination		0.005 lx F2.0 (AGC ON=54dB, Shutter=OFF)	
S/N		More than 55dB (AGC OFF=0dB, γ=1.0)	
Function settings		OSD : Remote controller	
AE mode	Fixed	1/60 sec.	1/50 sec.
		1/100, 1/120, 1/125, 1/250, 1/500, 1/1000, 1/2000, 1/4000, 1/8000, 1/10000, 1/20000, 1/50000, 1/100000 sec.	
	EI	1/60 - 1/100000 sec.	1/50 - 1/100000 sec.
White balance		ATW, AWB, PWB, MWB, PRESET (5100K, 6300K)	
AGC	ON	0 - 54dB	
	OFF	0dB	
MGC		0 - 54dB (6dB step)	
Day/Night		ICR mechaless Auto, Manual	
Gamma characteristics		γ=0.45	
Video level		Adjustable	
Noise reduction		2DNR OFF/ON Level adjustable	
Wide dynamic range		WDR OFF/ON Level adjustable, D-WDR OFF/ON Level adjustable	
Lens iris		DC	
Back light compensation		BLC, HSBLC	
White blemish correction		-	
Sharpness		Level adjustable	
Defog		OFF/ON Level adjustable	
Digital zoom		-	
Privacy mask		16 masks	
Mirror image		OFF, V-FLIP, H-FLIP, HV-FLIP	
Freeze		-	
Motion detection		-	
Neg.image		-	
Interface		4P connector (Composite Video, Power in), 2P connector (IR light ct), Remote controller (RC-01)	
Power supply		DC+5V - 12V	
Power consumption		0.6W/120mA (DC+5V), 0.72W/60mA (DC+12V)	
Operating temperature		-10 - +50°C	
Storage temperature		-30 - +70°C	
Operating / Storage humidity		95% RH or less (Without condensation)	
Lens mount		M12 P=0.5	
Standard lens		M3620BC-12 (f3.6 F2.0)	
Weight		Approx. 13g	
Accessories		4P cable, 2P cable	

### Specifications

Video standard		NTSC	PAL
Pick-up element		1/3.2 inch BSI CMOS image sensor	
Number of effective pixels		1280(H) × 960(V)	1280(H) × 924(V)
Unit cell size		3.5μm(H) × 3.5μm(V)	
Imaging system		RGB+W array mosaic filters on chip	
Synchronizing system		Internal	
Scanning system		Progressive	
Video output		Composite: 1.0 V(p-p) 75Ω (Unbalanced)	
Resolution (H)		More than 750TVL (Center)	
Minimum illumination		0.005 lx F2.5 (AGC ON=54dB, Shutter=OFF)	
S/N		More than 55dB (AGC OFF=0dB, γ=1.0)	
Function settings		OSD : Remote controller	
AE mode	Fixed	1/60 sec.	1/50 sec.
		1/100, 1/120, 1/125, 1/250, 1/500, 1/1000, 1/2000, 1/4000, 1/8000, 1/10000, 1/20000, 1/50000, 1/100000 sec.	
	EI	1/60 - 1/100000 sec.	1/50 - 1/100000 sec.
White balance		ATW, AWB, PWB, MWB, PRESET (5100K, 6300K)	
AGC	ON	0 - 54dB	
	OFF	0dB	
MGC		0 - 54dB (6dB step)	
Day/Night		ICR mechaless Auto, Manual	
Gamma characteristics		γ=0.45	
Video level		Adjustable	
Noise reduction		2DNR OFF/ON Level adjustable	
Wide dynamic range		WDR OFF/ON Level adjustable, D-WDR OFF/ON Level adjustable	
Lens iris		DC	
Back light compensation		BLC, HSBLC	
White blemish correction		-	
Sharpness		Level adjustable	
Defog		OFF/ON Level adjustable	
Digital zoom		-	
Privacy mask		16 masks	
Mirror image		OFF, V-FLIP, H-FLIP, HV-FLIP	
Freeze		-	
Motion detection		-	
Neg.image		-	
Interface		4P connector (Composite Video, Power in), 2P connector (IR light ct), Remote controller (RC-01)	
Power supply		DC+5V - 12V	
Power consumption		0.6W/120mA (DC+5V), 0.72W/60mA (DC+12V)	
Operating temperature		-10 - +50°C	
Storage temperature		-30 - +70°C	
Operating / Storage humidity		95% RH or less (Without condensation)	
Lens mount		M12 P=0.5	
Standard lens		3725BC-12P(A) (f3.7 F2.5)	
Weight		Approx. 8.5g	
Accessories		4P cable, 2P cable	

# WAT-3500

1/2.8" Multi-function Compact High Sensitivity Analog B&W Camera

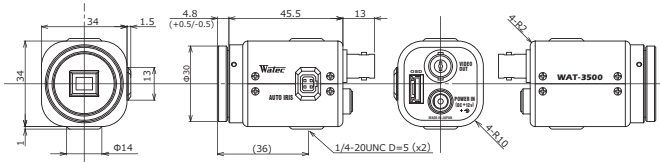
Typical design model with multi-functions in a small body



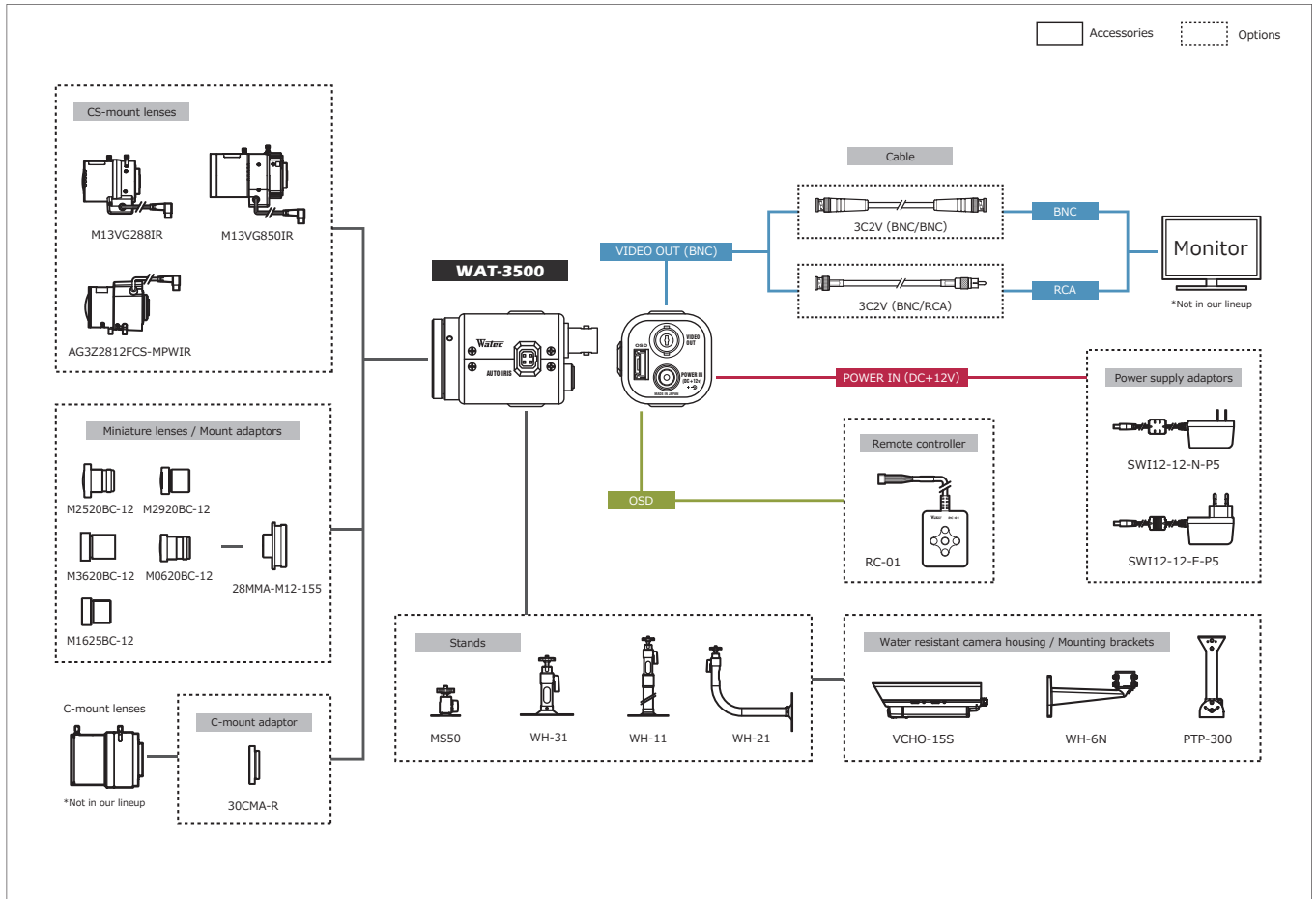
### Key features

- 1/2.8-inch BSI CMOS image sensor with high sensitivity
- Advanced setting available by OSD (On Screen Display) through an optional remote controller
- Min. illumination 0.0001 lx F1.4 (AGC HIGH=72dB, Shutter=OFF)  
0.000007 lx F1.4 (AGC HIGH=72dB, Shutter=x15)

### Dimensions



### System diagram



### Specifications

		EIA	CCIR
Video standard			
Pick-up element		1/2.8 inch BSI CMOS image sensor	
Number of effective pixels		1945(H) x 1097(V) *1	
Unit cell size		2.9µm(H) x 2.9µm(V)	
Imaging system		-	
Synchronizing system		Internal	
Scanning system		Progressive	
Video output		Composite: 1.0 V(p-p) 75Ω (Unbalanced)	
Setup level		7.5IRE	0IRE
Resolution (H)		More than 570TVL (Center)	
Minimum illumination		0.0001 lx F1.4 (AGC HIGH=72dB, Shutter=OFF)	
		0.000007 lx F1.4 (AGC HIGH=72dB, Shutter=x15)	
S/N		More than 45dB (AGC OFF=0dB, γ=1.0)	
Function settings		OSD : Remote controller	
AE mode	Fixed	x2, x3, x4, x5, x6, x7, x8, x9, x10, x12, x15 (frame)	
		1/30, 1/60, 1/120, 1/180, 1/240, 1/300 sec.	1/25, 1/50, 1/100, 1/150, 1/200, 1/250 sec.
	EI	1/500, 1/1000, 1/2000, 1/5000, 1/10000 sec.	1/25 - 1/10000 sec.
		x15 - 1/10000 sec.	
White balance		-	
AGC	ON	0 - 36dB (LOW), 0 - 50dB (MID), 0 - 72dB (HIGH)	
	OFF	0dB	
MGC		0 - 72dB (5dB step)	
Day/Night		-	
Gamma characteristics		γ=USER (Level adjustable)	
Video level		-	
Noise reduction		3DNR OFF/ON Level adjustable, 2DNR OFF/ON Level adjustable, 3D+2DNR ON Level adjustable	
Wide dynamic range		WDR OFF/ON Level adjustable, D-WDR OFF/ON Level adjustable	
Lens iris		DC	
Back light compensation		BLC, HSBLC	
White blemish correction		Up to 2046 pixels	
Sharpness		OFF/ON Level adjustable	
Defog		OFF/ON Level adjustable	
Digital zoom		ZOOM (x1.01 - x6.00), PAN/TILT	
Privacy mask		8 masks	
Mirror image		OFF, V-FLIP, H-FLIP, HV-FLIP	
Freeze		OFF/ON	
Motion detection		-	
Neg.image		OFF/ON	
Interface		BNC (Composite video), Power in, Remote controller (RC-01), Auto iris	
Power supply		DC+12V±10%	
Power consumption		2.04W (210mA)	
Operating / Storage temperature		-10 - +50°C / -30 - +70°C	
Operating / Storage humidity		95%RH or less (Without condensation)	
Lens mount		CS mount (Back focus adjustable)	
Weight		Approx. 78g	
Accessories		WPDC12 (DC plug), Hex. wrench	

\*1: The output is cut out according to the video standard.

Network

SDI

USB

Analog Color

Analog Monochrome

Options

Other

# WAT-660E (G3.8) 1/4" Miniature Camera

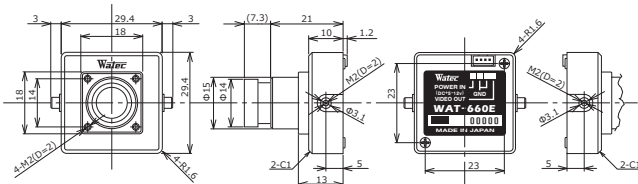
Compact square camera with built-in lens



### Key features

- Min.illumination 0.002 lx F2.0 (AGC ON=42dB, Shutter=OFF)
- Wide input voltage range (\*DC +5V - 12V)
- Various optional M12 lenses available \*Glass lenses and pinhole lens are not interchangeable

### Dimensions



# WAT-660E (P3.7) 1/4" Miniature Camera

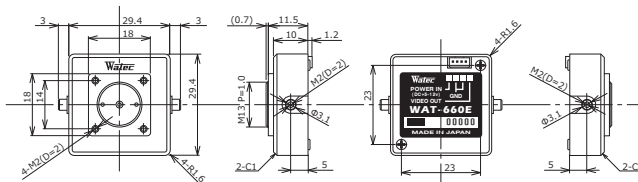
Compact square camera with built-in lens



### Key features

- Min.illumination 0.01 lx F4.5 (AGC ON=42dB, Shutter=OFF)
- Wide input voltage range (\*DC +5V - 12V)
- \*Glass lenses and pinhole lens are not interchangeable

### Dimensions



### Specifications

Video standard		EIA	CCIR
Pick-up element		1/4 inch CMOS image sensor	
Number of effective pixels		648(H) x 488(V)	
Unit cell size		5.6µm(H) x 5.6µm(V)	
Synchronizing system		Internal	
Scanning system		Progressive	
Video output		Composite video, 1.0 V(p-p) 75Ω (Unbalanced)	
Resolution (H)		More than 480TVL (Center)	
Minimum illumination		0.002 lx F2.0 (AGC ON=42dB, Shutter=OFF)	
S/N		More than 52dB (AGC OFF=0dB, γ=1.0)	
Function settings		-	
AE mode	Fixed	-	
	EI	1/60 - 1/100000 sec.	1/50 - 1/100000 sec.
AGC	ON	0 - 42dB	
	OFF	-	
MGC		-	
Gamma characteristics		γ=0.45	
Video level		100IRE	
Noise reduction		-	
Wide dynamic range		-	
Lens iris		-	
Back light compensation		BLC	
White blemish correction		-	
Sharpness		-	
Defog		-	
Digital zoom		-	
Privacy mask		-	
Mirror image		-	
Freeze		-	
Motion detection		-	
Neg.image		-	
Interface		4P connector (Composite Video, Power in)	
Power supply		DC+5V - 12V	
Power consumption		0.45W/90mA(DC+5V), 0.45W/37.5mA(DC+12v)	
Operating temperature		-10 - +50°C	
Storage temperature		-30 - +70°C	
Operating / Storage humidity		95% RH or less (Without condensation)	
Lens mount		M12 P=0.5	
Standard lens		3820BC-12 (f3.8 F2.0)	
Weight		Approx. 33g	
Accessories		4P cable	

### Specifications

Video standard		EIA	CCIR
Pick-up element		1/4 inch CMOS image sensor	
Number of effective pixels		648(H) x 488(V)	
Unit cell size		5.6µm(H) x 5.6µm(V)	
Synchronizing system		Internal	
Scanning system		Progressive	
Video output		Composite video, 1.0 V(p-p) 75Ω (Unbalanced)	
Resolution (H)		More than 480TVL (Center)	
Minimum illumination		0.01 lx F4.5 (AGC ON=42dB, Shutter=OFF)	
S/N		More than 52dB (AGC OFF=0dB, γ=1.0)	
Function settings		-	
AE mode	Fixed	-	
	EI	1/60 - 1/100000 sec.	1/50 - 1/100000 sec.
AGC	ON	0 - 42dB	
	OFF	-	
MGC		-	
Gamma characteristics		γ=0.45	
Video level		100IRE	
Noise reduction		-	
Wide dynamic range		-	
Lens iris		-	
Back light compensation		BLC	
White blemish correction		-	
Sharpness		-	
Defog		-	
Digital zoom		-	
Privacy mask		-	
Mirror image		-	
Freeze		-	
Motion detection		-	
Neg.image		-	
Interface		4P connector (Composite Video, Power in)	
Power supply		DC+5V - 12V	
Power consumption		0.45W/90mA(DC+5V), 0.45W/37.5mA(DC+12v)	
Operating temperature		-10 - +50°C	
Storage temperature		-30 - +70°C	
Operating / Storage humidity		95% RH or less (Without condensation)	
Lens mount		M13 P=1.0	
Standard lens		3745B-13P (f3.7 F4.5)	
Weight		Approx. 23g	
Accessories		4P cable	

CCTV Lenses



Series		DC Auto Iris Lenses (MP)				
Model		M13VG288IR	M13VG850IR	AG322812FCS-MPWIR	AG422812FCS-MPIR	EG323915FCS-MPWIR
Imager size		1/2.7", 1/3"	1/2.7", 1/3"	1/2.7", 1/3"	1/2.7", 1/3"	1/1.8", 1/2"
Mount type		CS	CS	CS	CS	CS
Focal length / Aperture range		2.8 - 8.0 mm / F1.2 - 360	8.0 - 50 mm / F1.6 - 360	2.8 - 8.5 mm / F1.2 - 360	2.8 - 10 mm / F1.2 - 360	3.9 - 10 mm / F1.5 - F360C
Angle of view (HxV)	1/1.8"	-	-	-	-	W:108.1° × 79.7° / T:42.1° × 32.0°
	1/2.7"	W:124.3° × 65.2° / T:43.0° × 24.2°	W:40.2° × 22.6° / T:6.6° × 3.8°	W:124.7° × 63.9° / T:41.3° × 22.7°	W:127.6° × 65.0° / T:34.3° × 18.9°	-
	1/3"	W:100.1° × 72.9° / T:35.8° × 26.8°	W:33.5° × 25.1° / T:5.6° × 4.2°	W: 99.1° × 72.3° / T:34.1° × 25.6°	W:101.3° × 73.7° / T:28.4° × 21.3°	W: 96.0° × 70.2° / T:37.9° × 28.4°



Series		Manual Iris Lenses (MP)	
Model		M13VM288IR	A422812CS-MPIR
Imager size		1/2.7", 1/3"	1/2.7", 1/3"
Mount type		CS	CS
Focal length / Aperture range		2.8 - 8.0 mm / F1.2 - Close	2.8 - 10 mm / F1.2 - F16C
Angle of view (HxV)	1/2.7"	W:124.3° × 65.2° / T:43.0° × 24.2°	W:127.6° × 65.0° / T:34.3° × 18.9°
	1/3"	W:100.1° × 72.9° / T:35.8° × 26.8°	W:101.3° × 73.7° / T:28.4° × 21.3°



Series		DC Auto Iris Lenses				Manual Iris Lenses
Model		12VG412ASIR	12VG1040ASIR	13VG308ASIR II	13VG1040ASIR	13VM308ASIR II
Imager size		1/2", 1/3"	1/2", 1/3"	1/3", 1/4"	1/3", 1/4"	1/3", 1/4"
Mount type		C	C	CS	CS	CS
Focal length / Aperture range		4.0 - 12 mm / F1.2 - 360	10 - 40 mm / F1.4 - 360	3.0 - 8.0 mm / F1.0 - 360	10 - 40 mm / F1.4 - 360	3.0 - 8.0 mm / F1.0 - Close
Angle of view (HxV)	1/2"	W:93.7° × 68.9° / T:31.2° × 23.4°	W:37.5° × 27.6° / T:9.3° × 7.0°	-	-	-
	1/3"	W:68.9° × 51.1° / T:23.4° × 17.5°	W:27.6° × 20.4° / T:7.0° × 5.3°	W:92.5° × 68.0° / T:35.7° × 26.8°	W:37.5° × 27.6° / T:9.3° × 7.0°	W:92.5° × 68.0° / T:35.7° × 26.8°
	1/4"	-	-	W:68.0° × 50.4° / T:26.8° × 20.1°	W:27.6° × 20.4° / T:7.0° × 5.3°	W:68.0° × 50.4° / T:26.8° × 20.1°

Miniature Lenses



Series		Miniature Lenses (MP)				
Model		M2520BC-12	M2920BC-12	M3620BC-12	M0620BC-12	M1625BC-12
Focal length / Aperture range		2.5 mm / F2.0	2.9 mm / F2.0	3.6 mm / F2.0	6.0 mm / F2.0	16 mm / F2.5
Angle of view (HxV)	1/2.8"	154.6° × 131.3° × 70.7°	134.9° × 115.3° × 62.8°	110.0° × 92.0° × 49.0°	62.0° × 53.8° × 30.0°	23.0° × 20.1° × 11.4°
	1/3"	143.2° × 111.1° × 81.7°	125.4° × 98.2° × 72.5°	102.0° × 77.0° × 56.0°	58.2° × 46.3° × 34.6°	21.3° × 17.1° × 12.9°
	1/3.2"	132.2° × 103.2° × 76.1°	116.2° × 91.2° × 67.6°	93.0° × 72.0° × 52.0°	54.2° × 43.1° × 32.3°	19.9° × 16.0° × 12.0°
	1/4"	103.6° × 87.7° × 60.7°	92.0° × 72.8° × 54.2°	73.0° × 57.0° × 42.0°	43.3° × 34.6° × 25.9°	16.2° × 13.0° × 9.8°
Mount		M12 P=0.5mm	M12 P=0.5mm	M12 P=0.5mm	M12 P=0.5mm	M12 P=0.5mm



Series		Miniature Lenses				
Model		2520BC-12	2920BC-12	3820BC-12	0625BC-12	0814BC-12
Focal length / Aperture range		2.5 mm / F2.0	2.9 mm / F2.0	3.8 mm / F2.0	6.0 mm / F2.5	8.0 mm / F1.4
Angle of view (HxV)	1/2"	-	-	-	-	54.6° × 44.4° × 33.7°
	1/3"	153.9° × 115.5° × 83.8°	122.1° × 96.6° × 71.9°	90.0° × 71.5° × 53.4°	57.8° × 45.7° × 34.0°	41.8° × 33.7° × 25.5°
	1/4"	107.2° × 83.8° × 61.9°	90.3° × 71.9° × 53.7°	67.0° × 53.4° × 40.0°	42.7° × 34.0° × 25.4°	-
Mount		M12 P=0.5mm	M12 P=0.5mm	M12 P=0.5mm	M12 P=0.5mm	M12 P=0.5mm



Series		Miniature Lenses			
Model		1220BC-12	2540EX014-M12	3720B-12P(B)	3745B-13P
Focal length / Aperture range		12 mm / F2.0	25 mm / F4.0	3.7 mm / F2.0	3.7 mm / F4.5
Angle of view (HxV)	1/2"	-	17.9° × 14.4° × 10.8°	-	-
	1/3"	28.5° × 22.8° × 17.2°	13.5° × 10.8° × 8.1°	90.0° × 57.8° × 48.6°	91.4° × 72.6° × 54.2°
	1/4"	21.4° × 17.2° × 12.9°	10.1° × 8.1° × 6.1°	63.5° × 48.6° × 35.7°	68.0° × 54.2° × 40.6°
Mount		M12 P=0.5mm	M12 P=0.5mm	M12 P=0.5mm	M13 P=1.0mm

## Extenders



Model	EX005-M12-2	EX010-M12-2	EX005-M13	EX010-M13
Material / Surface finishing	Aluminum / Black alumite (Pearskin finish)			
Mount	Lens: M12 P=0.5 / Camera: M12 P=0.5		Lens: M13 P=1.0 / Camera: M13 P=1.0	
Dimensions	Φ15 × 9 mm	Φ15 × 14 mm	Φ15 × 9 mm	Φ15 × 14 mm
Description	Lens mounts to be attached between a lens and a camera to extend the focal length			

## Mount Adaptors



Model	30CMA-R	34CMA-R	28MMA-M12-090	28MMA-M12-140
Material / Surface finishing	Aluminum / Black alumite (Pearskin finish)			
Mount	U1-32UN		M12 P=0.5	
Dimensions	Φ30 × 9 mm	Φ34 × 9 mm	Φ31 × 9 mm	Φ31 × 14 mm
Description	CS to C-mount adaptors allow which CS-mount CCTV cameras to be used with C-mount lenses		Lens mounts to make miniature lenses applicable to CS-mount cameras	



Model	28MMA-M12-155	22PMA-M12-125	29PMA-M12-125	30.5MMA-M12-120	22PMA-M13-040
Material / Surface finishing	Aluminum / Black alumite (Pearskin finish)				
Mount	M12 P=0.5				M13 P=1.0
Dimensions	Φ31 × 14.5 mm	Φ21.9 × 12.5 mm	Φ28.9 × 12.5 mm	Φ36 × 12 mm	Φ21.9 × 4 mm
Description	Lens mounts to make miniature lenses applicable to CS-mount cameras				

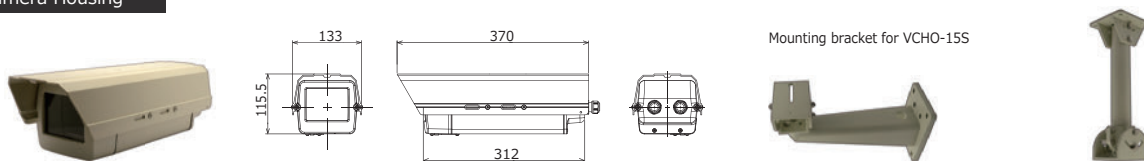
## Stands



Model	MS50	WH-31	WH-11	WH-21
Operating location	Ceiling (Indoor)	Ceiling (Indoor)	Ceiling (Two stage stretch, Indoor)	Wall/Ceiling (L type, Indoor)
Capability	-	-	Max. 2kg	-
Main materials	Steel SPCC and Aluminium			
Color	Black	Silver		
Dimensions	50(L) × 50(W) × 46.5(H) mm	Φ120 × 130(H) mm	Φ120 × 310 - 470 (H) mm	Φ120 × 204 × 242 (H) mm
Weight	Approx. 70g	Approx. 260g	Approx. 380g	Approx. 340g

\*Insulating kit (sold separately) is available for the MS50.

## Camera Housing



Model	VCHO-155	WH-6N	PTP-300
Operating location	Indoor / Outdoor	Wall (Indoor / Outdoor)	Ceiling (Indoor / Outdoor)
Main material	Aluminium (ADC-12, A6063)		
Color	Ivory		
Dimension	Inside dimension: 95(W) × 70(H) × 210(L) mm	337(L) × 115(W) × 176(H) mm	100(L) × 100(W) × 300(H) mm
Weight	Approx. 2.4kg	1.4kg	0.9kg
Other	Waterproof performance: IEC standard IPX5	Capability: 15Kg	Capability: 10Kg

## Holders



Model	H002	H003	TS01A
Materials	Brass / ABS resin	Brass	SUS304 / POM resin
Description	Bottom mounting bracket for cylindrical-type miniature cameras by attaching the folder ring included with camera (1/4-20UNC)	USB cable fixer for the WAT-06U2, WAT-07U2	Holder for attaching the WAT-03U2D, WAT-06U2D, WAT-07U2D to the side such as a helme

## Brackets



Model	B001	B004	B005
Materials	Brass / ABS resin		ABS resin
Supported models	WAT-1300 (G3.6), WAT-1300/CS, WAT-660E	WAT-2200 Mk-2, WAT-3200	WAT-06U2, WAT-07U2, WAT-08U2 (G3.6), WAT-09U2 (G3.6), WAT-1200CS
Description	Brackets for fixing the cameras on a stands or tripods		



Model	B007	B008	B009
Materials	Brass / ABS resin		SUS304
Supported models	WAT-2400		WAT-05U2M
Description	Brackets for fixing the cameras on a stands or tripods		Clip for attaching the camera to a pocket

## Conversion Connectors



3G/HD-SDI supported

Model	BNCP-RCAJ	RCAP-BNCJ	BNC-A-JJ	BCJ-JK
Description	Cable conversion connector (RCA to BNC)	Cable conversion connector (BNC to RCA)	Relay connector (BNC to BNC)	Relay connector (BNC to BNC)

## Remote Controllers



Model	AVM-USB2	RC-01	RC-02
Description	Equipment for the functional settings of the WAT-240E/FS	Remote controller for the OSD (On Screen Display) function settings for supported models. The OSD allows you to set camera functions with the setting menu on the monitor while simultaneously checking the video.	
Cable length	Approx. 50mm	Approx. 1.5m	
Dimensions	20(H) × 44(W) × 7(D) mm (w/o cable)	50(H) × 40.5(W) × 12(D) mm (Excluding cable)	

## Power Supply Adaptors



Model	SWI6-5.9-N-P13 *	SWI12-12-N-P5	SWI12-12-E-P5
Input voltage	AC100 - 240V		AC100 - 240V
Output voltage / Current	DC+5.9V / 1.2A		DC+12V / 1.0A
Plug type	Type A	Type A	Type C
Connector	EIAJ2 (Φ4.0 × Φ1.7)		Φ5.5 × Φ2.1
Weight	Approx. 78g	Approx. 126g	Approx. 126g

\*Please purchase from us because of the unique connector shape.

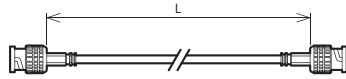
## HD-SDI Converter

Model	VPC-SHSSTD
Supported resolution	SD-SDI: 720×480i/59.94, 720×576i/50, HD-SDI: 1280×720p59.94/p60/p50, 1920×1080i/59.94/i60/i50, 1920×1080p23.98/p24/p25/p29.97/p30, 3G-SDI Level A: 1920×1080p59.94/p60/p50, 3G-SDI Level B-DL: 1920×1080p59.94/p60/p50 *Not supported 3G-SDI Level B-DS
Input / Output terminal	HDMI type A ×1, SDI (75ΩBNC) ×2
USB connector	USB Micro-B ×1
Case materials	SECC
Dimensions	63.6(W) × 103.6(D) × 22.5(H) mm (Including bracket)
Weight	204g
Power (AC adaptor)	AC adaptor: AC+100 - 240V, DC+12V 160mA
Power (USB bus power)	USB bus power: +5V 330mA
Max. power consumption	AC 2.27W
Operating temperature / humidity	0 - 50°C, 20 - 80% RH (without condensing)
Storage temperature / humidity	-20 - +60°C, 5 - 90% RH (without condensing)



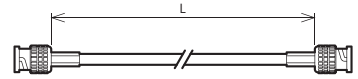
Coaxial Cables

3G/HD-SDI supported

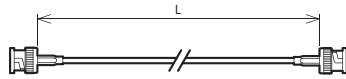


Model	Length(=L)m	Cable	Connector
2.5CHD(BNC/BNC)-2.5M	2.5	75Ω coaxial cable L-2.5CHD (Black) *Cable for fixed wiring	75Ω BNC plug (Crimp type)
2.5CHD(BNC/BNC)-3M	3		
2.5CHD(BNC/BNC)-5M	5		
2.5CHD(BNC/BNC)-10M	10		

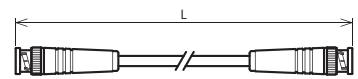
3G/HD-SDI supported



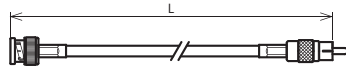
Model	Length(=L)m	Cable	Connector
3CFW(BNC/BNC)-2.5M	2.5	75Ω coaxial cable L-3CFW (Black) *Cable for portable wiring	75Ω BNC plug (Crimp type)
3CFW(BNC/BNC)-3M	3		
3CFW(BNC/BNC)-5M	5		
3CFW(BNC/BNC)-10M	10		



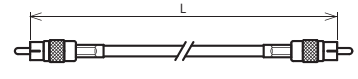
Model	Length(=L)m	Cable	Connector
1.5C2V(BNC/BNC)-1M	1	75Ω coaxial cable 1.5C-2V (Black)	75Ω BNC plug (Crimp type)



Model	Length(=L)m	Cable	Connector
3C2V(BNC/BNC)-2.5M	2.5	75Ω coaxial cable 3C-2V (Black)	75Ω BNC plug (Crimp type)
3C2V(BNC/BNC)-3M	3		
3C2V(BNC/BNC)-5M	5		
3C2V(BNC/BNC)-10M	10		

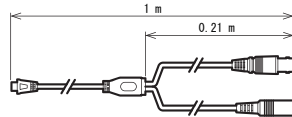


Model	Length(=L)m	Cable	Connector
3C2V(BNC/RCA)-2.5M	2.5	75Ω coaxial cable 3C-2V (Black)	75Ω BNC plug (Crimp type) RCA plug (Crimp type)
3C2V(BNC/RCA)-3M	3		
3C2V(BNC/RCA)-5M	5		
3C2V(BNC/RCA)-10M	10		

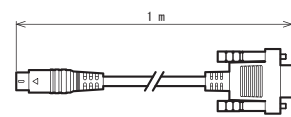


Model	Length(=L)m	Cable	Connector
3C2V(RCA/RCA)-2.5M	2.5	75Ω coaxial cable 3C-2V (Black)	RCA plug (Crimp type)
3C2V(RCA/RCA)-3M	3		
3C2V(RCA/RCA)-5M	5		
3C2V(RCA/RCA)-10M	10		

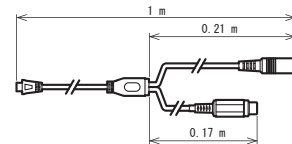
Cable with Connectors



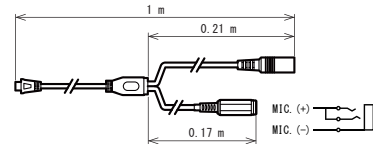
Model	Supported models	Description	Connector
CB-01M	WAT-1200CS, WAT-1100MBD, WAT-660E	Video/Power cable for the supported models.	VIDEO IN (BNC), POWER IN (DC Jack)



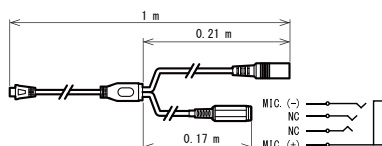
Model	Supported models	Description	Connector
CB-03	WAT-2200 Mk-2, WAT-3200	RS-232 communication cable	D-SUB connector (9PIN)



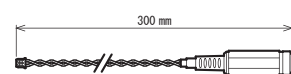
Model	Supported models	Description	Connector
CB-06M	WAT-2400S, WAT-933	Utilize when connecting the LINE output.	POWER IN (DC Jack), LINE IN (RCA Jack)



Model	Supported models	Description	Connector
CB-07M	WAT-2400S, WAT-933	Utilize when connecting the mic which is plug-in power type.	POWER IN (DC Jack), MIC. IN (3-Conductor miniature jack)



Model	Supported models	Description	Connector
CB-09M	WAT-2400S, WAT-933	Utilize when connecting the CTIA / AHJ compatible mic.	POWER IN (DC Jack), MIC. IN (4-Conductor miniature jack)



Model	Supported models	Description	Connector
CB-10	WAT-1300 (G3.6), WAT-1300/CS	Power cable for the supported models.	POWER IN (DC Jack)

## ■ Camera and Lens Combinations

	Camera	Lens type	Mount adaptor	Compatible lens
Network	WAT-2400S	CCTV	–	M13VG288IR, M13VG850IR, AG3Z2812FCS-MPWIR
	WAT-933	MINI	28MMA-M12-155	M2520BC-12, M2920BC-12, M3620BC-12, M0620BC-12, M1625BC-12
	WAT-2400	CCTV	–	M13VG288IR, M13VG850IR, AG3Z2812FCS-MPWIR
		MINI	28MMA-M12-140	M2520BC-12, M2920BC-12, M3620BC-12, M0620BC-12, M1625BC-12
SDI	WAT-2200 Mk-2	CCTV	–	M13VG288IR, M13VG850IR, AG3Z2812FCS-MPWIR
	WAT-3200	MINI	29PMA-M12-125	M2520BC-12, M3620BC-12, M0620BC-12, M1625BC-12
	WAT-1300 (G3.6)	MINI	–	M2520BC-12, M3620BC-12, M0620BC-12, M1625BC-12
	WAT-1300/CS	CCTV	–	M13VM288IR
USB	WAT-06U2 WAT-07U2	CCTV	–	M13VM288IR, A4Z2812CS-MPIR
		MINI	28MMA-M12-155	M2520BC-12, M3620BC-12, M0620BC-12, M1625BC-12
			28MMA-M12-140	M2920BC-12
	WAT-08U2 (G3.6) WAT-09U2 (G3.6)	MINI	–	M2520BC-12, M2920BC-12, M3620BC-12, M0620BC-12, M1625BC-12
	WAT-08U2D (G2.5)	MINI	–	M2520BC-12, M2920BC-12
	WAT-08U2D (G3.6)	MINI	–	M3620BC-12, M0620BC-12, M1625BC-12
	WAT-03U2D WAT-06U2D Series WAT-07U2D Series	MINI	–	M3620BC-12, M0620BC-12, M1625BC-12
	Analog Color	WAT-2500	CCTV	–
MINI			28MMA-M12-155	M2520BC-12, M2920BC-12, M3620BC-12, M0620BC-12, M1625BC-12
WAT-1200CS		CCTV	–	M13VG288IR, M13VG850IR, AG3Z2812FCS-MPWIR
WAT-240E (G3.8) WAT-240E/CB (G3.8) WAT-240E/FS(G3.8)		MINI	–	2520BC-12, 2920BC-12, 3820BC-12, 0625BC-12, 1220BC-12, M1625BC-12, 2540EX014-M12
WAT-1100MBD (G3.6)		MINI	–	M2520BC-12, M3620BC-12, M0620BC-12, M1625BC-12
Analog Monochrome	WAT-3500	CCTV	–	M13VG288IR, M13VG850IR, AG3Z2812FCS-MPWIR
		MINI	28MMA-M12-155	M2520BC-12, M2920BC-12, M3620BC-12, M0620BC-12, M1625BC-12
	WAT-660E (G3.8)	MINI	–	2520BC-12, 2920BC-12, 3820BC-12, 0625BC-12, 1220BC-12, M1625BC-12, 2540EX014-M12

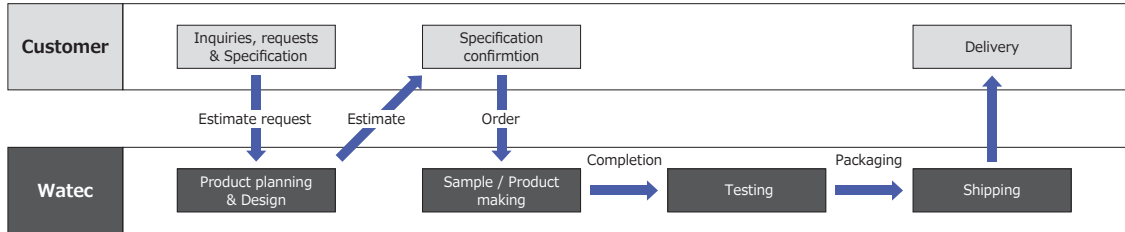
## ■ Glossary

<b>Gamma Correction</b>	Function to correct video signal to earn proper contrast on monitored image
<b>BLC (Back Light Compensation)</b>	Function to adjust exposure of silhouetted subject by bright light behind
<b>Defog</b>	Function to improve image quality captured under poor weather condition such as fog, rain, snow, etc.
<b>Minimum Illumination</b>	Value (lx.) to describe how dark the camera can capture usable image
<b>Imaging System</b>	Type of filter systems adapted by color camera sensors (Primary color system: high color reproducibility, Complement color system: high sensitivity)
<b>Horizontal Resolution</b>	Value (TVL) to describe image fineness the camera can provide to monitor in horizontally (The higher, the finer)
<b>Cell Size</b>	Value to describe size of unit pixel of image sensor (The bigger, the better in sensitivity and the less saturation output)
<b>Serial Communication</b>	Function to allow remote operation of parameter setting change or OSD setting for RS232 or RS485 communication method
<b>ICR Mechaless Day/Night</b>	Function to realize Day/Night switching without using an ICR (Infrared Cut filter Removal) mechanism by combining an RGBW image sensor and an optical dual-pass filter. When the ambient illumination is low such as at night, the sensitivity of the camera can be improved by capturing images including near-infrared wavelengths using the W (white) pixels, thereby enhancing visibility at night.
<b>Motion Detection</b>	Function to detect moving object and provide addressed task in detection
<b>Noise Reduction</b>	Function to reduce noise from the image captured in high gain condition (2D: perform within 1 frame, 3D: perform by using the images before and after)
<b>White Blemish Correction</b>	Function to automatically correct white pixels
<b>Privacy Masking</b>	Function to cover addressed area in captured image for privacy protection purpose
<b>FL (Flickerless)</b>	Function to reduce flicker phenomenon from images captured under commercial power frequency 50Hz
<b>White Balance</b>	Function to optimize color reproduction in accordance with the lighting condition
<b>Mirror Image</b>	Function to obtain horizontal and/or top-bottom inverted image
<b>WDR (Wide Dynamic Range)</b>	Function to stabilize contrast of light and shadow to provide clear and usable image when object has extremely bright and dark parts at once
<b>AE Mode (Automatic Exposure Mode)</b>	Function to automatically control shutter speed to provide appropriate and stable brightness level to image
<b>AGC</b>	Function to automatically control gain of amplifier to provide visible image under low light condition
<b>HD-SDI</b>	HD-SDI is the abbreviation of High Definition Serial Digital Interface, which delivers high quality live HD video over coaxial cable with exceptional resolution and image detail. HD-SDI technology delivers image quality that is far superior to analog CCTV that is easy to install and integrate with existing CCTV systems. (e.g.: WAT-2200 Mk-2, WAT-3200, WAT-1300 Series)
<b>HSBLC (HLC)</b>	Function to reduce reflection of light by masking the part(s) containing strong light to improve visibility of image
<b>MGC</b>	Function to fix gain of amplifier
<b>OSD</b>	An on-screen display (OSD) is a control panel on a monitor that allows you to select viewing options
<b>S/N</b>	Value (dB) to describe the strength of video signal compare to the back ground noise

## ■ Technical Support Customizations

### About Customizations

Utilizing the techniques and experience we have developed since Watec's founding, we actively accepted special orders and customizations to meet customer needs. We also accept small-scale orders of custom-made products or products with changes in specifications. Please ask a distributor or Watec for details. Please note that we may not be able to meet all requests and the per-unit cost may increase depending on the request. Please contact Watec if you have any questions.



### Special Order / Customization Examples

- Change to specified lenses
- Modification of cable length and wire
- Change of body color and print content
- Manufacturing of lens mounts plus other additional manufacturing
- Change of connectors
- Alteration of various function settings and/or default settings

Please see the "Special Modifications" section of each product on our website for further details.

## ■ Technical Tips

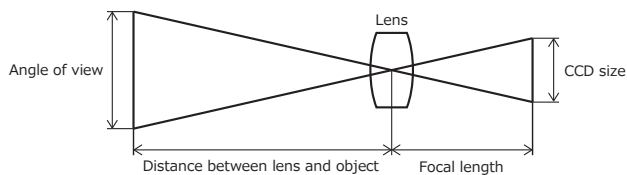
### Guide of Minimum Illumination

#### Lighting condition

Clear sunny sky	10000 lx	Twilight	1 lx
Cloudy sky	1000 lx	Full moon	0.1 lx
Office (with window)	500 lx	A half moon	0.01 lx
Office (no window)	100 lx	Star light	0.001 lx

### Calculation of the Focal Length

$$\text{Focal length (mm)} = \frac{\text{Distance between lens and object (m)} \times \text{CCD size [ H / W ] (mm)}}{\text{Angle of view [ Height / width of object ] (m)}}$$



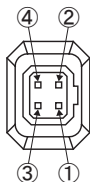
CCD size(mm)

$$1/2" = 4.8(H) \times 6.4(W) \quad 1/2.8" = 3.1(H) \times 5.6(W)$$

$$1/3" = 3.6(H) \times 4.8(W) \quad 1/3.2" = 2.5(H) \times 4.4(W)$$

$$1/4" = 2.7(H) \times 3.6(W)$$

### Pin Configuration Guide for Auto Iris Connectors



Pin	EIAJ Video	EIAJ DC	Watec
①	Power	Control -	Power
②	Not used	Control +	Iris signals
③	Iris signals	Drive +	GND
④	GND	Drive -	GND

## ■ Watec Technical Support

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### For Those Considering a Watec Purchase

Our distributors and sales representatives provide many customizations in order to meet your purposes, situation, and needs.

### For Current Users of Watec Products

Our distributors and sales representatives provide support for when you need a new product or your needs change. We also provide support for performance issues and product repairs. For product repairs, please see the After-sales Service section.

Please feel free to contact us at any time.

## ■ After-sales Service

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### Warranty

All Watec products before being shipped to our customers are tested and inspected to ensure that our products are not faulty and are of the highest quality as directed by our Watec Quality-control System. Watec camera have a 3-year warranty, and the board camera units and peripherals have a 1-year warranty, provided that the products have been operated in accordance with our operation manual and have not been altered in any way.

NB: The Watec 3-year warranty does not cover image sensor repair or replacement caused by whiteblemish phenomena.

### Repair Service

Watec makes it a policy to repair Watec products first hand with the appropriate charge in accordance with the detailed defect information supplied by you. All repairs in the Watec workshop are quickly and precisely dealt with and returned after the shortest repair period possible.

### About white blemish

White blemish is a pixel on the sensor chip which leave an irremovable white spot on the image. There are two factors for white pixel to be made: 1. production process factor (due to the unevenness of pixels), and 2. after production factor (due to Cosmic-ray exposure).

In the case of 1. production process factor, not only the manufactures but also Watec strictly check with white blemish at the final inspections to make sure the products with white blemish over the permissiblerange won't be dispatched to the customers.

On the other hand, we are not able to prevent the cameras to earn white blemishes caused by 2. after production factor, because there is no effective solution found, even with the latest study, to block the sensors from exposure to Cosmic-ray. The occurrence rate of this phenomenon increases with the high sensitivity sensors due to their structure. For this reason, the sensor makers don't provide warranty for white blemish with after production factor.

As there is no way to protect the sensors from Cosmic-ray exposure, Watec is not able to take responsibility for our cameras to earn white blemishes with after production factor; therefore, Watec warranty does not cover white blemishes for our products after shipping to the customers.

## ■ Company Profile

### Overview

Company Name	Watec Co., Ltd.
Established	March 20, 1987
President	Shigeto Igarashi
Board Member	Directors: 3, Auditors: 2
Paid Up Capital	¥ 58,500,000

### History

1987	Established in Tono, Kawasaki at a received capital of ¥13,000,000
1990	Yamagata factory was built in Higashine, Yamagata.
1994	Taiwan Branch opened in Taipei, Taiwan
1996	Head office moved to Tsuruoka from Kawasaki.
1997	Capital increased to ¥19,500,000
1999	The U.S. subsidiary, Genwac, Inc. was founded in Orangeburg, NY.
2004	Capital increased to ¥29,250,000  Watec Co., Ltd. Beijing Liaison Office opened in Beijing, China.
2005	The U.S. subsidiary, Genwac, Inc. changes its name to Watec, Inc.
2006	Selected as one of the 300 of Japan's Vibrant Monodzukuri (Manufacturing) small and medium-size(d) enterprises, 2006 by Japanese Ministry of Economy, Trade and Industry
2007	Capital increased to ¥58,500,000
2011	ISO 9001:2008 approved
2014	Tokyo sales office opened in Tokyo
2017	ISO 9001:2015 approved

### Contacts

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#### Watec Co., Ltd. Tokyo Sales Office

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E-mail: watec@ms5.hinet.net / watecbeijing@gmail.com  
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[www.watec.co.jp](http://www.watec.co.jp)