



**WATEC CO., LTD.**



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# WAT-2400S 1/2.8" Compact High Sensitivity Network Color Camera

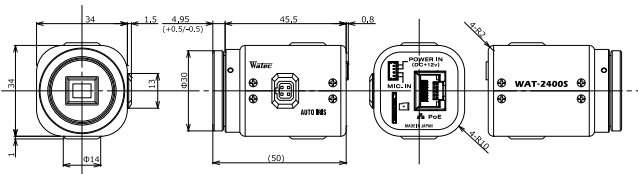
As small as WAT-902 series



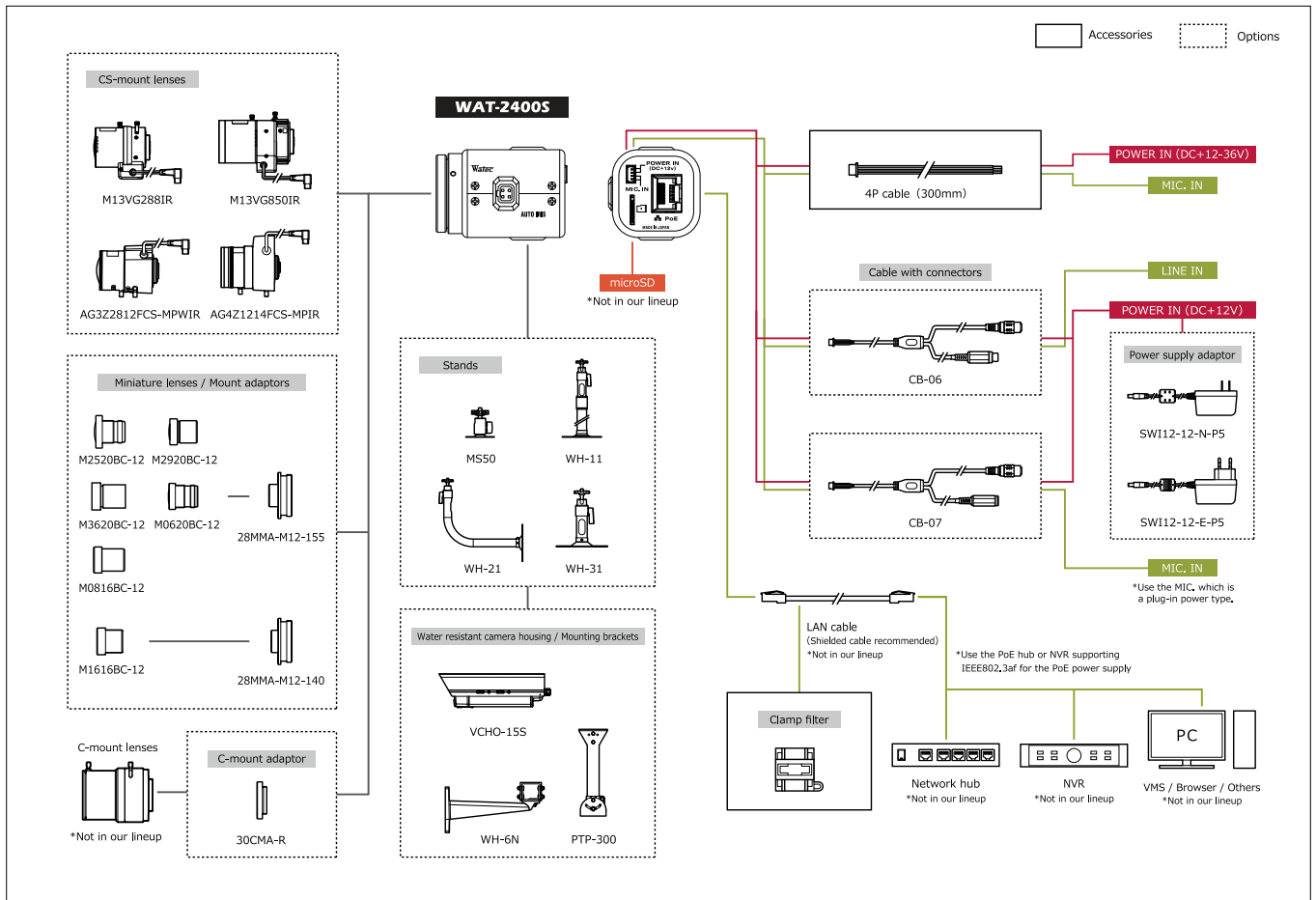
### Key features

- Supporting microSD enables stand-alone recording without the network connection
- Video output quick start-up in 6 sec.
- Power-saving PoE : 1.92W/40mA DC+12V : 1.56W/130mA

### Dimensions



### System diagram



### Specifications

Pick-up element	1/2.8 inch BSI CMOS image sensor		
Number of effective pixels	1945(H) × 109(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	1920×1080, 1280×720, 800×600, 704×480, 704×400, 640×480, 640×360, 320×240		
Max. frame rate	30 fps		
Video compression	H.264, MJPEG		
Minimum Illumination	0.007 lx F1.2 (AGC HIGH=72dB, Shutter=OFF)		
S/N	-		
Function settings	Browser		
AE mode	Fixed	1/30, 1/60, 1/120, 1/250, 1/500, 1/1000, 1/25, 1/50, 1/100, 1/200, 1/400, 1/800, 1/2000, 1/4000, 1/8000, 1/15000, 1/16000, 1/32000, 1/64000, 1/128000, 1/30000 (sec.) *1	
		1/30 - 1/30000 (sec.) *1	1/25 - 1/25600 (sec.) *2
		×32 - 1/30000 (sec.) *1 *3	×32 - 1/25600 (sec.) *2 *3
AE mode	EI	1/30 - 1/30000 (sec.) *1	1/25 - 1/25600 (sec.) *2
		×32 - 1/30000 (sec.) *1 *3	×32 - 1/25600 (sec.) *2 *3
White balance	ATW, PWB, MWB, PRESET (3000K, 5000K, 8000K)		
AGC	ON	0 - 72dB	
	OFF	0dB	
MGC	-		
Day/Night	-		
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,		
	SNTP, HTTP, FTP, DHCP, DNS		
Interface	RJ45 (10BASE-T, 100BASE-TX), 4P Connector (MIC, IN, POWER IN), Auto iris,		
	microSD (Recommended: SDHC / SDXC standard, MLC type, Speed Class CLASS 10 or more, Capacity of 128GB or less)		
Power supply	PoE +48V (IEEE802.3af), DC+12 - 36V +12V is recommended for DC input		
Power consumption	1.92W/40mA (PoE +48V), 1.56W/130mA (DC+12V)		
Operating temperature	0 - +50°C		
Storage temperature	-30 - +70°C		
Operating / Storage humidity	95% RH or less (Without condensation)		
Lens mount	CS mount (Back focus adjustable)		
Weight	Approx. 80g		
Accessories	4P cable, Hex, wrench, Clamp filter		

\*1: Frequency=60Hz \*2: Frequency=50Hz \*3: When using the Slow Shutter \*ONVIF is a trademark of Onvif, Inc. \*microSD is a trademark of SD Association. SD, SDHC and SDXC (and logos) are trademarks of SD-3C, LLC. \*XProtect is a registered trademark of Milestone Systems A/S.

# WAT-933

1/2.8" Compact High Sensitivity Network B&W Camera

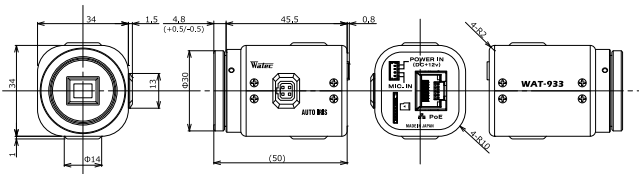
As small as WAT-902 series



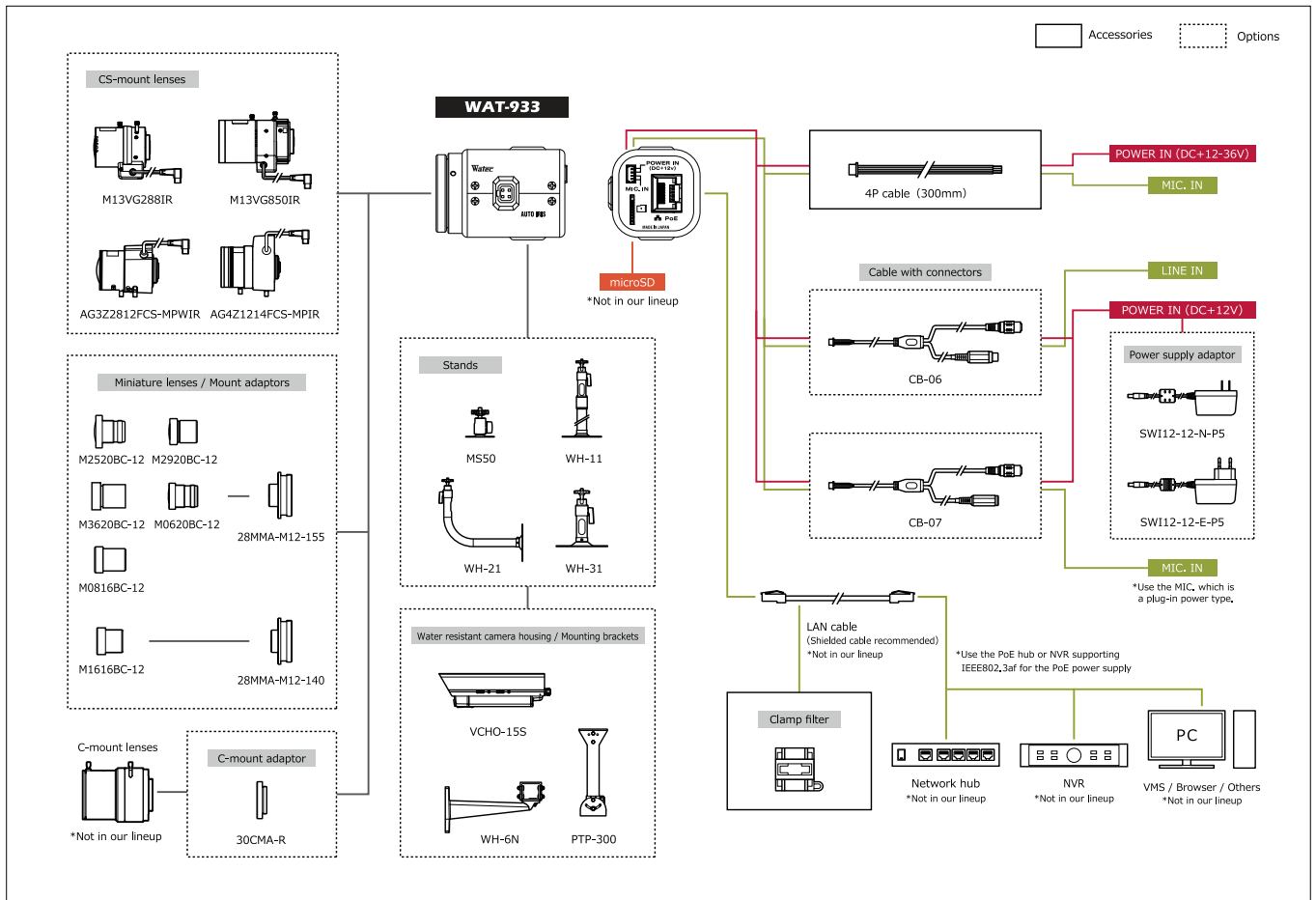
### Key features

- Supporting microSD enables stand-alone recording without the network connection
- Video output quick start-up in 6 sec.
- Power-saving PoE : 1.92W/40mA DC+12V : 1.56W/130mA

### Dimensions



### System diagram



### Specifications

Pick-up element	1/2.8 inch BSI CMOS image sensor	
Number of effective pixels	1945(H) × 109(V)	
Unit cell size	2.9µm(H) × 2.9µm(V)	
Imaging system	—	
Synchronizing system	Internal	
Scanning system	Progressive	
Output size	1920×1080, 1280×720, 800×600, 704×480, 704×400, 640×480, 640×360, 320×240	
Max. frame rate	30 fps	
Video compression	H.264, MJPEG	
Minimum Illumination	0.0001 lx F1.4 (AGC HIGH=72dB, Shutter=OFF)	
S/N	—	
Function settings	Browser	
AE mode	Fixed	1/30, 1/60, 1/120, 1/250, 1/500, 1/1000, 1/25, 1/50, 1/100, 1/200, 1/400, 1/800, 1/2000, 1/4000, 1/8000, 1/15000, 1/16000, 1/32000, 1/64000, 1/128000, 1/256000 (sec.) *2
		1/30000 (sec.) *1
	EI	1/30 - 1/30000 (sec.) *1 ×32 - 1/30000 (sec.) *1 *3
White balance	ATW, PWB, MWB, PRESET (3000K, 5000K, 8000K)	
AGC	ON	0 - 72dB
	OFF	0dB
MGC	—	
Day/Night	—	
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,	
	SNTP, HTTP, FTP, DHCP, DNS	
Interface	RJ45 (10BASE-T, 100BASE-TX), 4P Connector (MIC, IN, POWER IN), Auto iris, microSD (Recommended: SDHC / SDXC standard, MLC type, Speed Class CLASS 10 or more, Capacity of 128GB or less)	
Power supply	PoE +48V (IEEE802.3af), DC+12 - 36V +12V is recommended for DC input	
Power consumption	1.92W/40mA (PoE +48V), 1.56W/130mA (DC+12V)	
Operating temperature	0 - +50°C	
Storage temperature	-30 - +70°C	
Operating / Storage humidity	95% RH or less (Without condensation)	
Lens mount	CS mount (Back focus adjustable)	
Weight	Approx. 80g	
Accessories	4P cable, Hex, wrench, Clamp filter	

\*1: Frequency=60Hz \*2: Frequency=50Hz \*3: When using the Slow Shutter \*ONVIF is a trademark of Onvif, Inc. \*microSD is a trademark of SD Association. SD, SDHC and SDXC (and logos) are trademarks of SD-3C, LLC. \*XProtect is a registered trademark of Milestone Systems A/S.

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

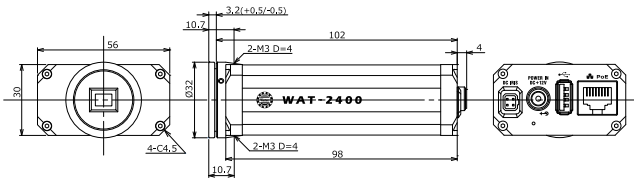
Full HD CMOS sensor



### Key features

- Customization flexible firmware (Required software can be included to the camera)
- 1/2.8-inch 2M 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+12V input
- ONVIF® profile S compliant

### Dimensions

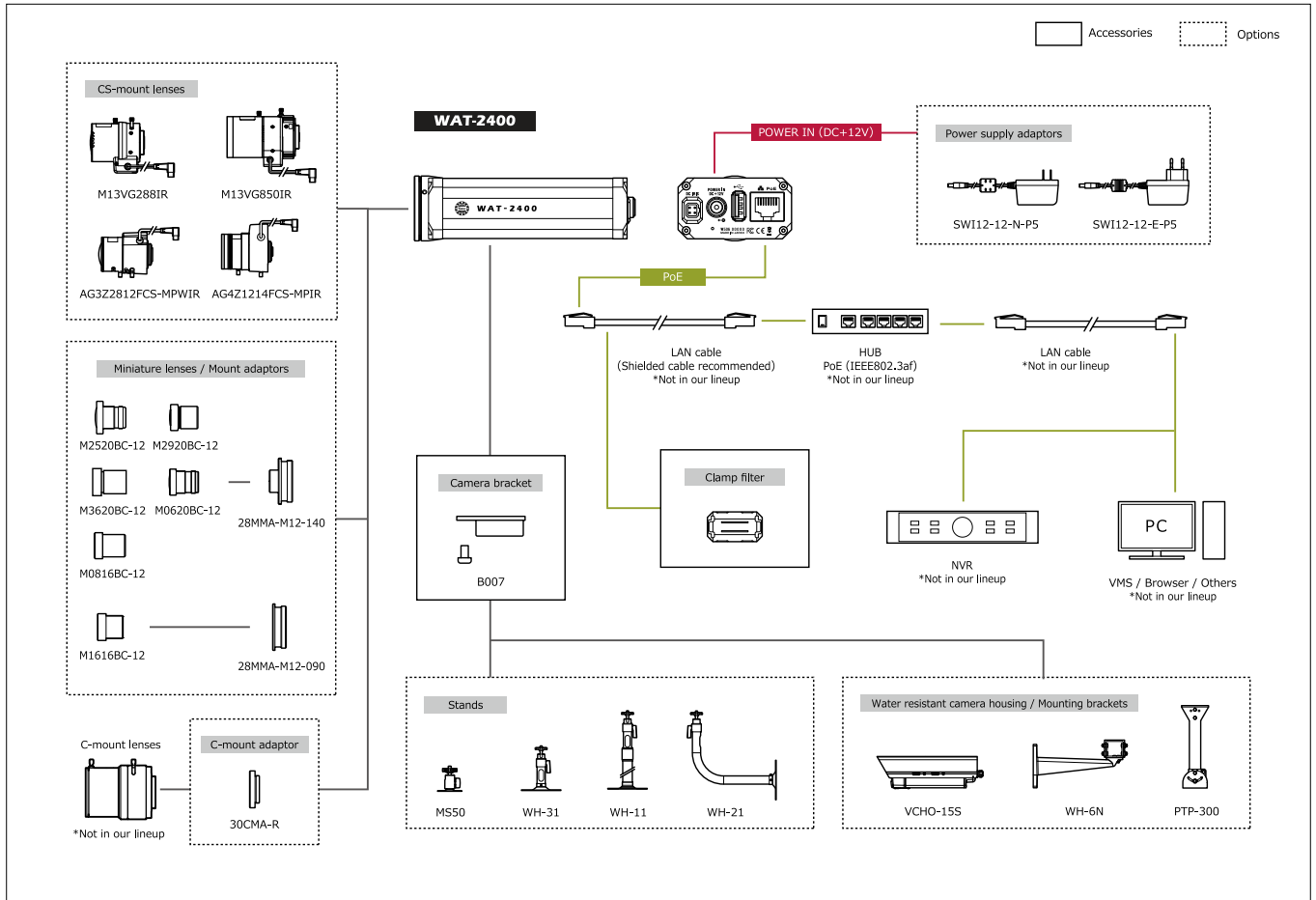


### Specifications

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(UDP), 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	WPDCL12 (DC plug), Hex. Wrench, B007 (Camera Bracket), Clamp Filter

\*ONVIF is a trademark of Onvif, Inc.

### System diagram



# WAT-2200 Mk-2

1/2.8" Professional 3G/HD-SDI Camera

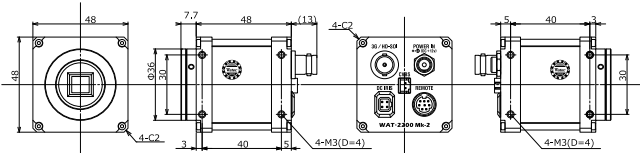
Fully upgraded all performance from WAT-2200



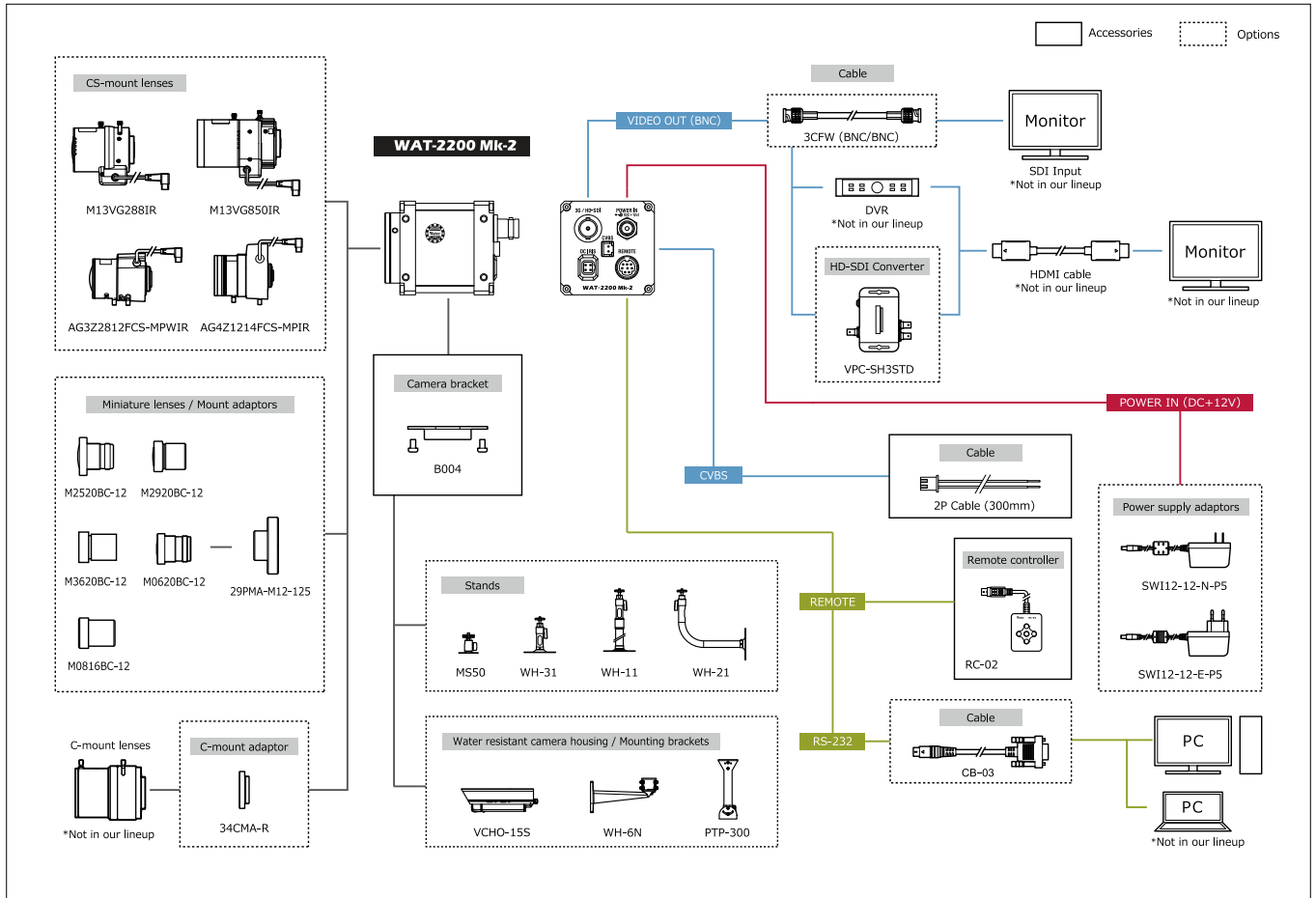
### Key features

- 1/2.8-inch BSI CMOS image sensor with high sensitivity
- Min. illumination 0.006 lx F1.2 (AGC HIGH=72dB, Shutter=OFF)  
0.0004 lx F1.2 (AGC HIGH=72dB, Shutter=x15)
- Sixteenfold increase in sensitivity than the previous model
- Full HD 1080/60p resolution with 3G-SDI/HD-SDI interface and low latency

### 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 filter on chip	
Synchronizing System	Internal	
Scanning System	Progressive	
Video Outputs	3G-SDI, HD-SDI	
Output Format	Composite video: 1.0 V(p-p) 75Ω (Unbalanced) 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 1000TVL (Center)	
Min. Illumination	0.006 lx F1.2 (AGC HIGH=72dB, Shutter=OFF) 0.0004 lx F1.2 (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) x2, x3, x4, x5, x6, x7, x8, x9, x10, x12, x15 (frame)	
AE Mode	Fixed	1/30, 1/60, 1/120, 1/180, 1/240, 1/300 sec.*1 1/500, 1/1000, 1/2000, 1/5000, 1/10000 sec.
	EI	1/30 - 1/10000 sec.*1 x15 - 1/10000 sec. 1/25 - 1/10000 sec.*2
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, HSBC	
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 control)	

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

# WAT-30HD (G3.6) 1/3" Ultra-compact HD-SDI Color Camera

Ultra-compact design with Full HD 1920x1080p CMOS sensor

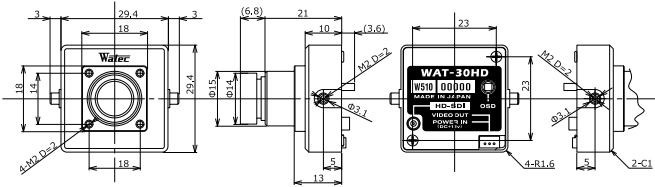


\*No CE & FCC

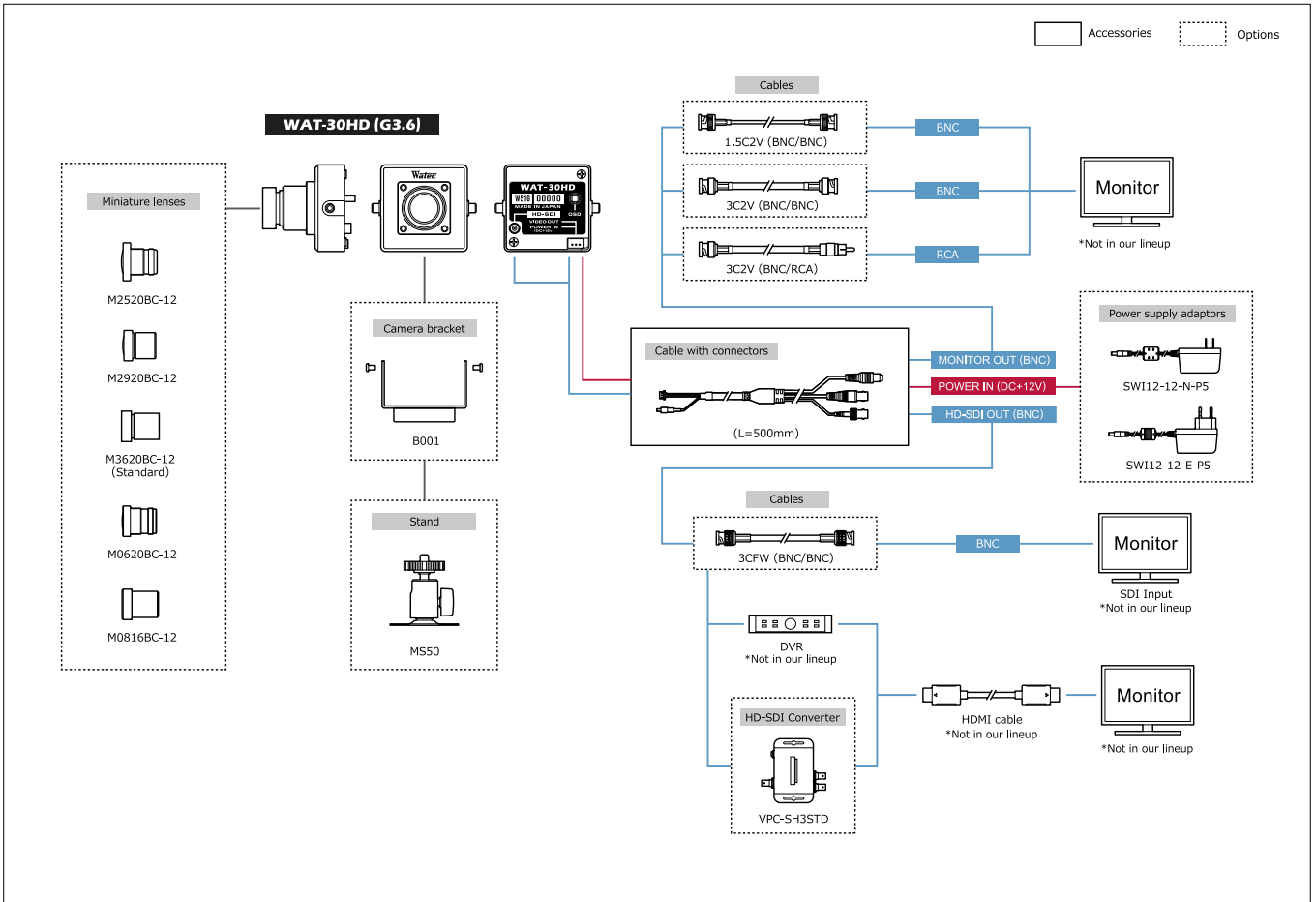
### Key features

- Only 30mm square with 35g achieves 2.1 Megapixel HD-SDI
- "Double shutter" & "Digital" wide dynamic range selectable
- Advanced setting available by OSD (On Screen Display) through on-camera joystick
- SD / analog output for checking image at set up
- Various optional M12 lenses available \*Glass lenses and pinhole lens are not interchangeable

### Dimensions



### System diagram



### Specifications

Pick-up element	1/3 inch CMOS image sensor	
Number of effective pixels	1944(H) × 1092(V)	
Unit cell size	2.75µm × 2.75µm	
Imaging system	RGB primary color bayer arrangement mosaic filters on chip	
Synchronizing system	Internal	
Scanning system	Progressive	
Video outputs	HD-SDI Composite : 1.0 V(p-p) 75Ω (Unbalanced)	
Output format	1080/30p, 1080/25p, 720/60p*, 720/50p*, NTSC, PAL *Imaging 30/25 fps	
Resolution (H)	More than 900 (Center)	
Minimum illumination	0.1 lx F2.0 (AGC ON=60dB, Shutter=OFF) 0.01 lx F2.0 (AGC ON=50dB, Shutter=x32)	
S/N	More than 52dB (AGC OFF=120B, γ=0.45)	
Function settings	OSD : Joystick	
AE mode	Fixed	1/30, 1/60, 1/120 sec. *1080/30p, 720/60p mode 1/25, 1/50, 1/100 sec. *1080/25p, 720/50p mode 1/250, 1/500, 1/1000, 1/2000, 1/4000, 1/8000, 1/16000, 1/30000 sec.
	EI	1/30 - 1/30000 sec. *1080/30p, 720/60p mode 1/25 - 1/30000 sec. *1080/25p, 720/50p mode x32 - 1/30000 sec.
White balance	ATW, PWB, MWB	
AGC	ON	12 - 60dB (Max. 12 - 60dB)
	OFF	12dB
MGC	-	
Day/Night	Digital Auto, Manual	
Gamma characteristics	γ=0.45	
Noise reduction	3DNR OFF/ON Level adjustable	
Wide dynamic range	WDR OFF/ON Level adjustable, D-WDR OFF/ON	
Lens iris	-	
Back light compensation	BLC, HSBLC	
White blemish correction	Up to 1024 pixels	
Sharpness	Level adjustable	
Defog	OFF/ON Level adjustable	
Digital zoom	ZOOM (x1.0 - x20.0)	
Privacy mask	16 masks	
Mirror image	OFF, V-FLIP, H-FLIP, HV-FLIP	
Freeze	-	
Motion detection	OFF/ON 1areas arbitrarily configurable	
Neg. image	-	
Interface	MMCX (HD-SDI), 3P connector (Composite Video, Power in)	
Power supply	DC+12V±10%	
Power consumption	1.44W (120mA)	
Operating temperature	-10 - +50°C	
Storage temperature	-20 - +60°C	
Operating / Storage humidity	80% RH or less / 95% RH or less (Without condensation)	
Lens mount	M12 P=0.5	
Standard lens	M3620BC-12 (F3.6 F2.0)	
Weight	Approx. 35g	
Accessories	Cable with connectors	



# WAT-30HD/CS 1/3" Ultra-compact HD-SDI Color Camera

Ultra-compact design with Full HD 1920x1080p CMOS sensor

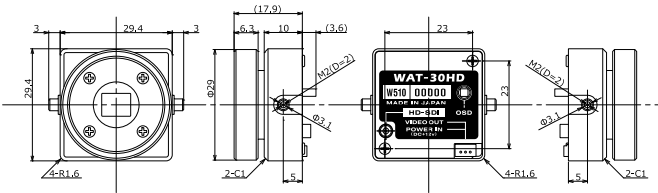


\*No CE & FCC

### Key features

- Only 30mm square with 27.5g achieves 2.1 Megapixel HD-SDI
- "Double shutter" & "Digital" wide dynamic range selectable
- Advanced setting available by OSD (On Screen Display) through on-camera joystick
- SD / analog output for checking image at set up

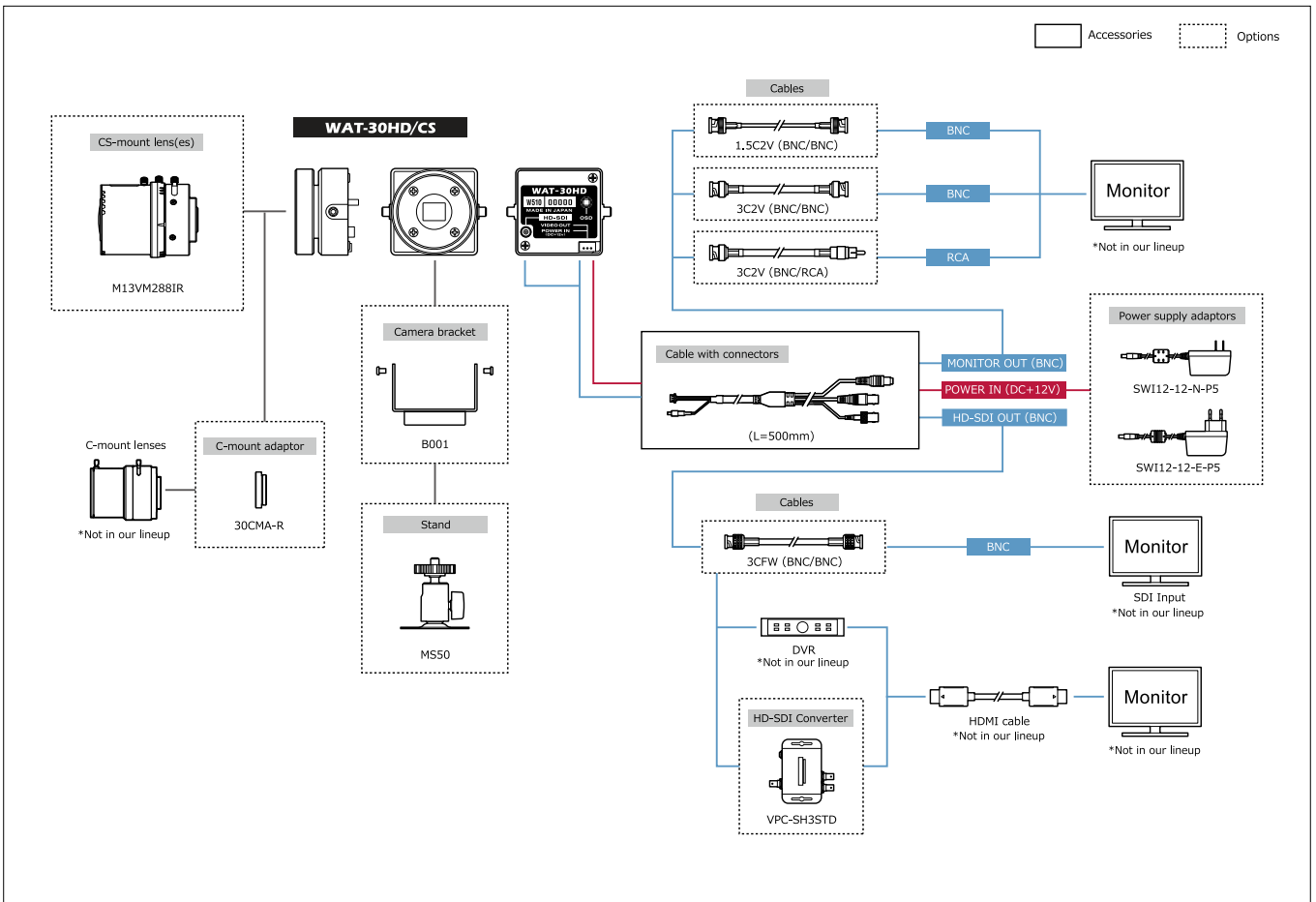
### Dimensions



### Specifications

Pick-up element	1/3 inch CMOS image sensor	
Number of effective pixels	1944(H) x 1092(V)	
Unit cell size	2.75µm x 2.75µm	
Imaging system	RGB primary color bayer arrangement mosaic filters on chip	
Synchronizing system	Internal	
Scanning system	Progressive	
Video outputs	HD-SDI	
Output format	Composite : 1.0 V(p-p) 75Ω (Unbalanced)	
Resolution (H)	1080/30p, 1080/25p, 720/60p*, 720/50p*, NTSC, PAL *Imaging 30/25 fps	
Minimum illumination	0.05 lx F1.2 (AGC ON=60dB, Shutter=OFF)	
S/N	More than 52dB (AGC OFF=12dB, γ=0.45)	
Function settings	OSD : Joystick	
AE mode	Fixed	1/30, 1/60, 1/120 sec. *1080/30p, 720/60p mode
	EI	1/25, 1/50, 1/100, 1/200, 1/400, 1/800, 1/1600, 1/30000 sec.
White balance	ON	1/25 - 1/30000 sec. *1080/30p, 720/60p mode
	OFF	1/25 - 1/30000 sec. *1080/25p, 720/50p mode
AGC	ON	12 - 60dB (Max, 12 - 60dB)
	OFF	12dB
MGC	-	
Day/Night	Digital Auto, Manual	
Gamma characteristics	γ=0.45	
Noise reduction	3DNR OFF/ON Level adjustable	
Wide dynamic range	WDR OFF/ON Level adjustable, D-WDR OFF/ON	
Lens iris	-	
Back light compensation	BLC, HSBLIC	
White blemish correction	Up to 1024 pixels	
Sharpness	Level adjustable	
Defog	OFF/ON Level adjustable	
Digital zoom	ZOOM (x1.0 - x20.0)	
Privacy mask	16 masks	
Mirror image	OFF, V-FLIP, H-FLIP, HV-FLIP	
Freeze	-	
Motion detection	OFF/ON 1areas arbitrarily configurable	
Neg. image	-	
Interface	MMCX (HD-SDI), 3P connector (Composite Video, Power in)	
Power supply	DC+12V±10%	
Power consumption	1.44W (120mA)	
Operating temperature	-10 - +50°C	
Storage temperature	-20 - +60°C	
Operating / Storage humidity	80% RH or less / 95% RH or less (Without condensation)	
Lens mount	CS mount	
Weight	Approx. 27.5g	
Accessories	Cable with connectors	

### System diagram



# WAT-03U2

1/3" Compact High Sensitivity USB2.0 HD Color Camera

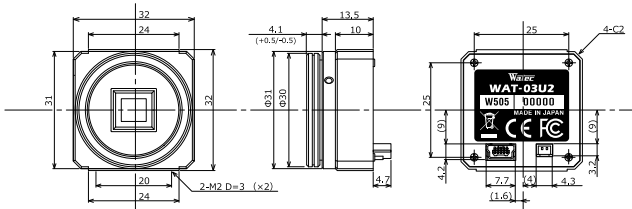
Directly import the captured image to your PC and compact design specializes in the embedded application



### Key features

- High sensitivity 1.3 M CMOS sensor
- Min. illumination 0.02 lx F1.2 (AGC ON=42dB, Shutter=OFF)  
0.005 lx F1.2 (AGC ON=42dB, Shutter=1/7.5 sec.)
- Frame rate : 30fps (HD), 60fps (VGA)
- USB Video Class & USB Bus Power (plug & play)

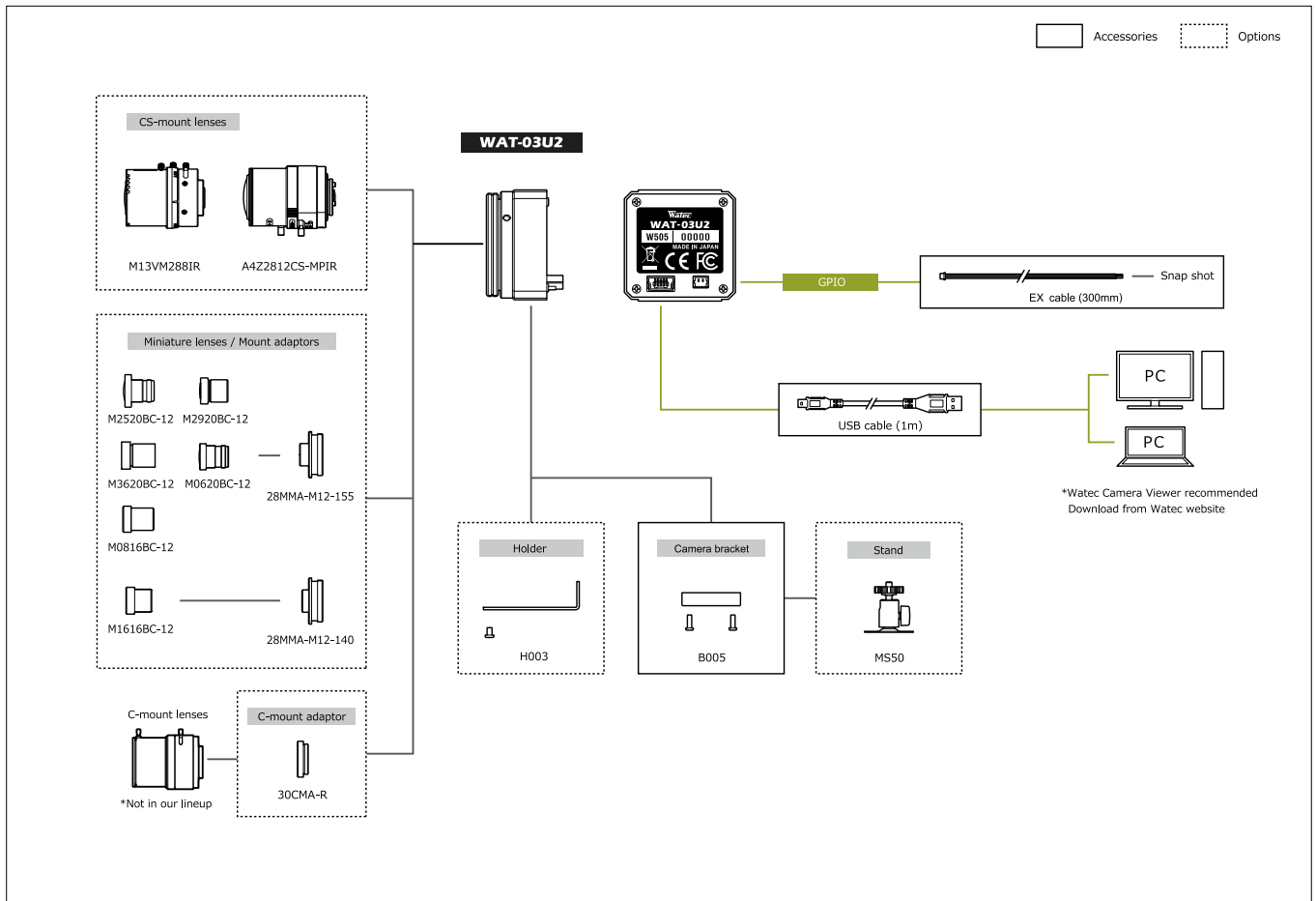
### Dimensions



### Specifications

Pick-up element	1/3 inch CMOS image sensor	
Number of effective pixels	1305(H) x 977(V)	
Unit cell size	3.75um(H) x 3.75um(V)	
Imaging system	RGB primary color bayer arrangement mosaic filters on chip	
Synchronizing system	Internal	
Scanning system	Progressive	
Output size	1280x960, 1280x720, 640x480, 320x240	
Max. frame rate	60 fps	
Video compression	MJPEG, YUY2	
Video output	USB Video Class (Compatible)	
Minimum illumination	0.02 lx F1.2 (AGC ON=42dB, Shutter=OFF) 0.005 lx F1.2 (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.
White balance	ATW, MWB	1/30 - 1/8000 sec.
	AGC	1/7.5 - 1/8000 sec.
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 (High speed), 2P connector (Snap shot)
Power supply		USB +5V
Power consumption		0.75W (150mA)
Operating temperature		-10 - +50°C
Storage temperature		-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
Min. System Requirements	CPU	800MHz or faster
	RAM	512MB or larger
	Others	USB2.0 Port
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 7 32bit/64bit, Windows 8 32bit/64bit, Windows 8.1 32bit/64bit, Windows 10 32bit/64bit

### System diagram



# WAT-01U2 1/2.8" Compact Full HD USB2.0 Camera

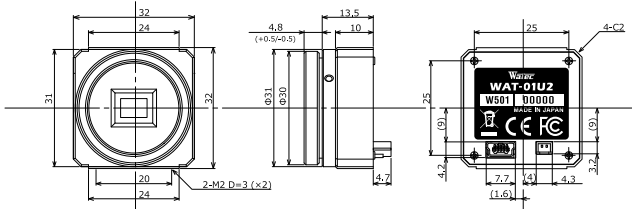
Directly import the captured image to your PC and compact design specializes in the embedded application



### Key features

- Compact design (32 x 32mm) with CS lens mount and light weight
- 1/2.8-inch megapixel CMOS image sensor achieves the effective pixels 1984(H) x 1225(V)
- The internal ISP (Image Signal Processor) ensures optimal image quality depending on the usage environment
- USB Video Class & USB Bus Power (plug & play)
- Simple viewer software with features to change the camera settings and capture images.

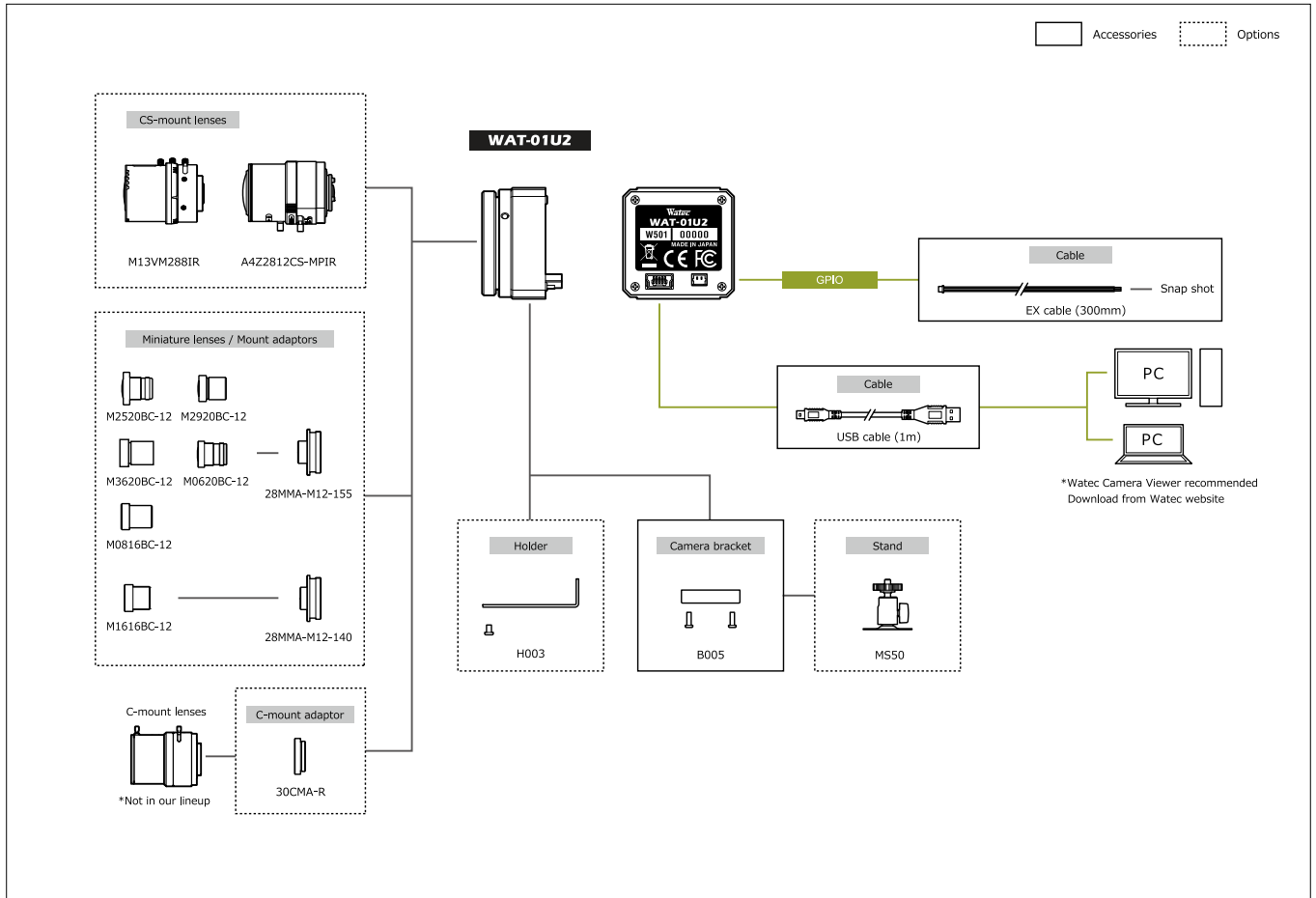
### Dimensions



### Specifications

Pick-up element	1/2.8 inch CMOS image sensor	
Number of effective pixels	1984(H) x 1225(V)	
Unit cell size	2.8μm(H) x 2.8μm(V)	
Imaging system	RGB primary color bayer arrangement mosaic filters on chip	
Synchronizing system	Internal	
Scanning system	Progressive	
Output size	1920x1080, 1280x1024, 1280x800, 1280x720, 640x480, 320x240, 176x144, 160x120	
Max. frame rate	30 fps	
Video compression	MJPEG, YUY2	
Video output	USB Video Class (Compatible)	
Resolution (H)	More than 680TVL (Center)	
Minimum illumination	0.2 lx F1.2 (AGC ON=42dB, Shutter=OFF) 0.1 lx F1.2 (AGC ON=42dB, Shutter=1/15 sec.)	
S/N	-	
Function settings	Camera Viewer	
AE mode	Fixed	1/15 sec.
	EI	1/30, 1/60, 1/120, 1/250, 1/500, 1/1000, 1/2000, 1/4000, 1/8000 sec.
White balance	ON	1/30 - 1/8000 sec.
	OFF	1/15 - 1/8000 sec.
AGC	ON	ATW, MWB
	OFF	0 - 42dB
MGC		0 - 24dB
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 (High speed), 2P connector (Snap shot)
Power supply		USB +5V
Power consumption		0.6W (120mA)
Operating temperature		-10 - +50°C
Storage temperature		-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
Min. System Requirements	CPU	800MHz or faster
	RAM	512MB or larger
	Others	USB2.0 Port
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 XP 32bit/64bit (SP2, 3), Windows Vista 32bit/64bit, Windows 7 32bit/64bit, Windows 8 32bit/64bit, Windows 8.1 32bit/64bit, Windows 10 32bit/64bit	

### System diagram



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

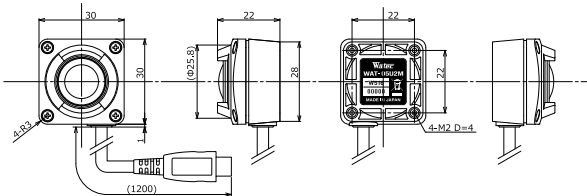
Compact water resistant camera (Dimensions: H30×W30×D22mm)



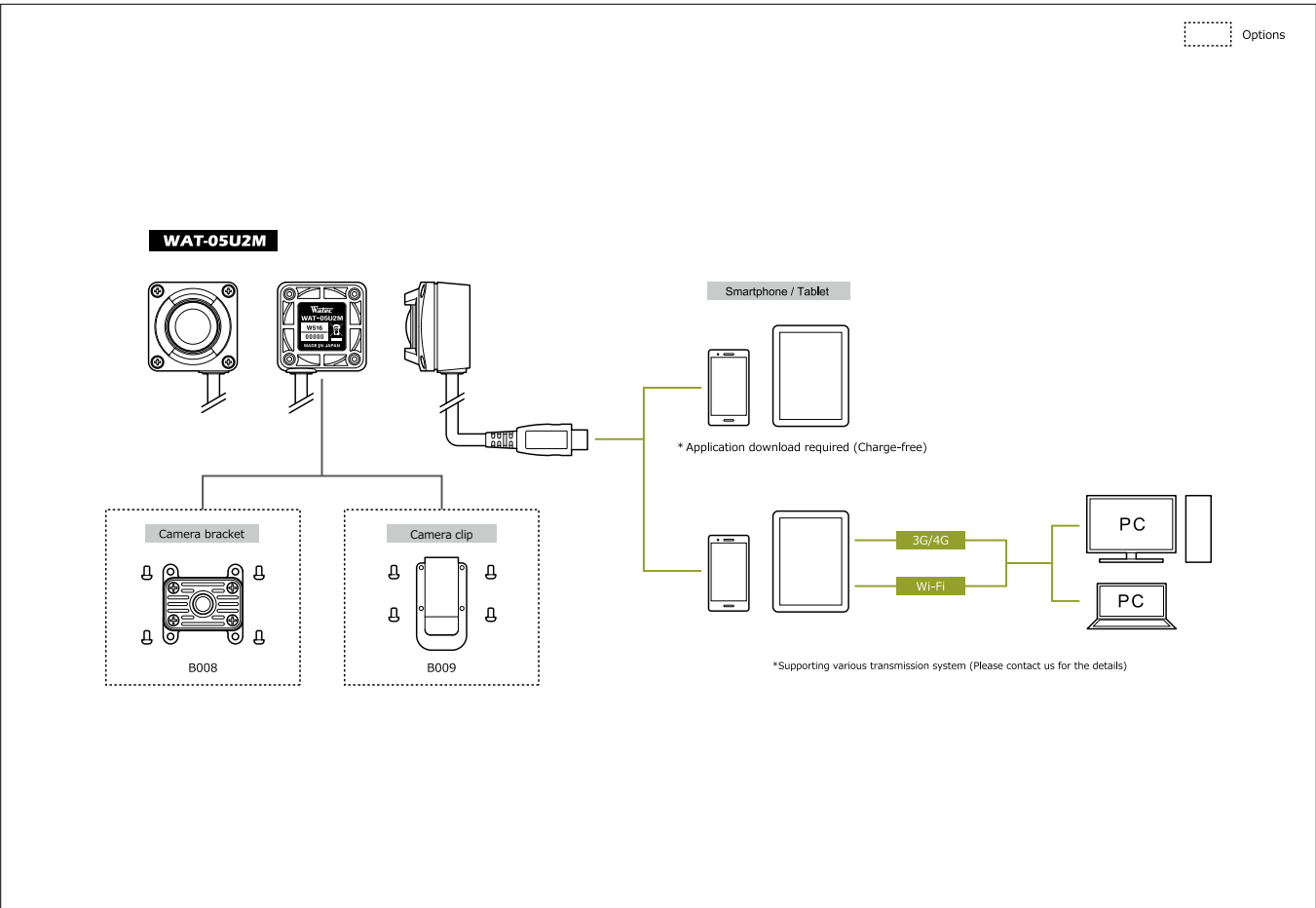
### Key features

- 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) \*The other sides are available on request
- Enable the live video transmission via the smartphone or tablet by its Wi-Fi or 4G/3G
- Water resistant built for outdoor use (IPX7 compliance)

### 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	
	1/15, 1/7.5, 1/4 sec.	
AE mode	Fixed	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	γUSER (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 (High speed)	
Power supply	USB +5V	
Power consumption	0.85W (170mA)	
Operating temperature	-10 - +50°C	
Storage temperature	-30 - +60°C	
Operating / Storage humidity	95% RH or less (Without condensation)	
Standard lens	M1720BC-12 (f1.7 F2.0)	
Cable length	1.2m	
Weight	Approx. 45g	
Accessories	-	
Min. System Requirements	CPU	800MHz or faster
	RAM	512MB or larger
	Others	USB2.0 Port
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-03U2D 1/3" High Sensitivity USB2.0 HD Water Resistant Camera

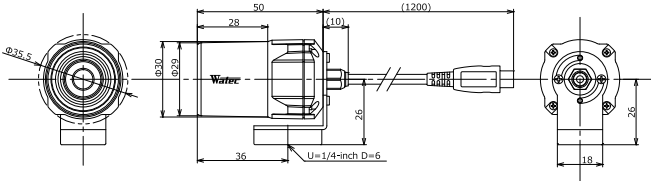
IPX7 Water resistance



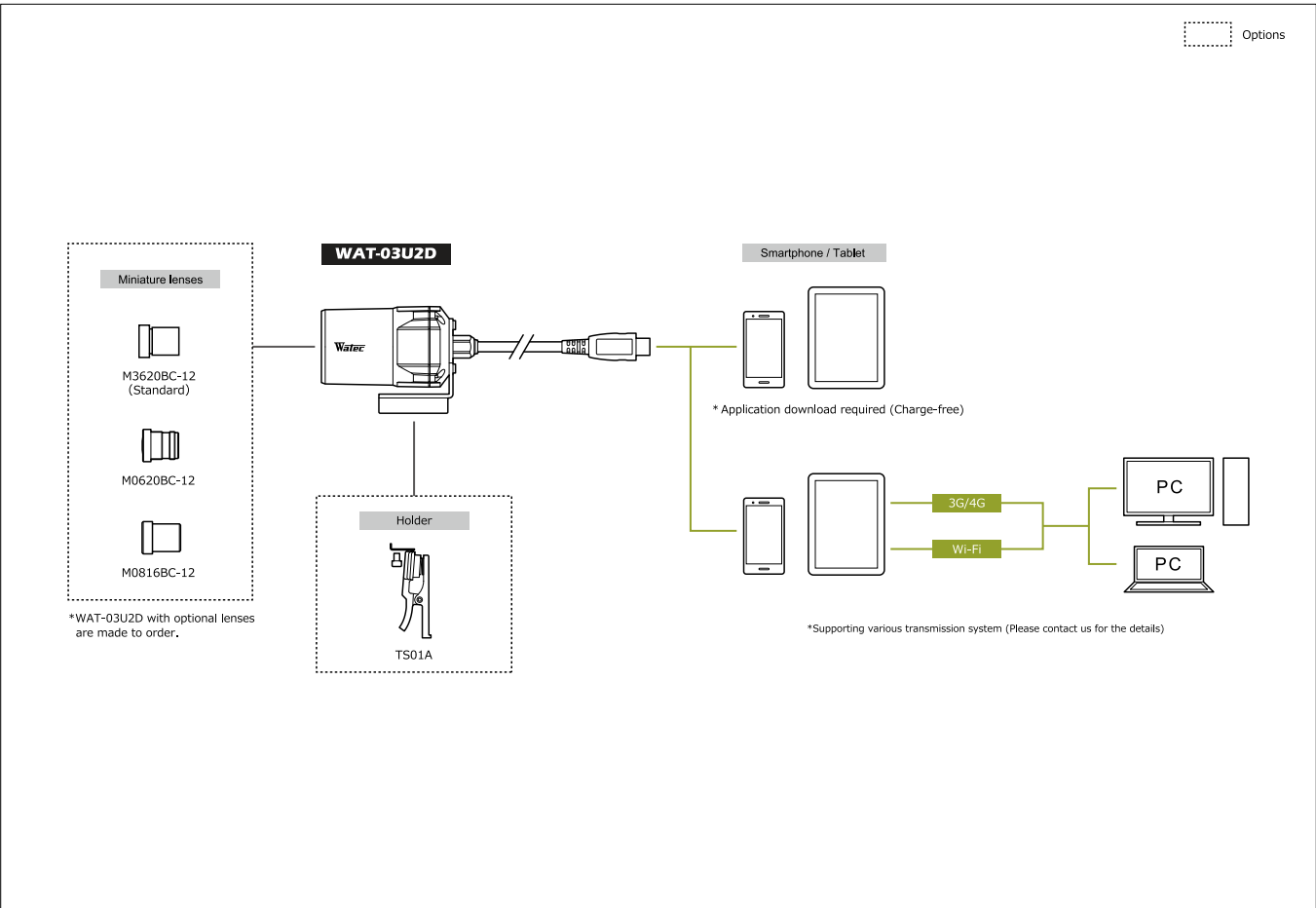
### Key features

- 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 structure for outdoor use

### Dimensions



### System diagram



### Specifications

Pick-up element	1/3 inch CMOS image sensor	
Number of effective pixels	1305(H) x 977(V)	
Unit cell size	3.75µm(H) x 3.75µm(V)	
Imaging system	RGB primary color bayer arrangement mosaic filters on chip	
Synchronizing system	Internal	
Scanning system	Progressive	
Output size	1280x960, 1280x720, 640x480, 320x240	
Max. frame rate	60 fps	
Video compression	MJPEG, 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 (High speed)	
Power supply	USB +5V	
Power consumption	0.75W (150mA)	
Operating temperature	-10 - +50°C	
Storage temperature	-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	-	
Min. System Requirements	CPU	800MHz or faster
	RAM	512MB or larger
	Others	USB2.0 Port
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 7 32bit/64bit, Windows 8 32bit/64bit, Windows 8.1 32bit/64bit, Windows 10 32bit/64bit, Android 4.0 or newer	

# WAT-02U2D 1/2.8" USB2.0 Full HD Water Resistant Camera

Compact Full HD

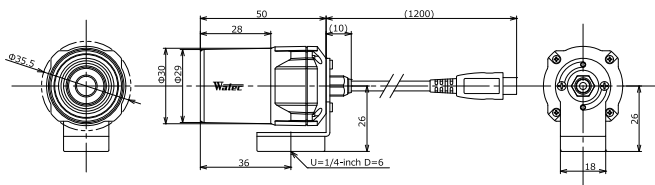


\*No CE & FCC

### Key features

- USB Video Class
- Full HD (Max. frame rate 30fps)
- Water resistant structure for outdoor use

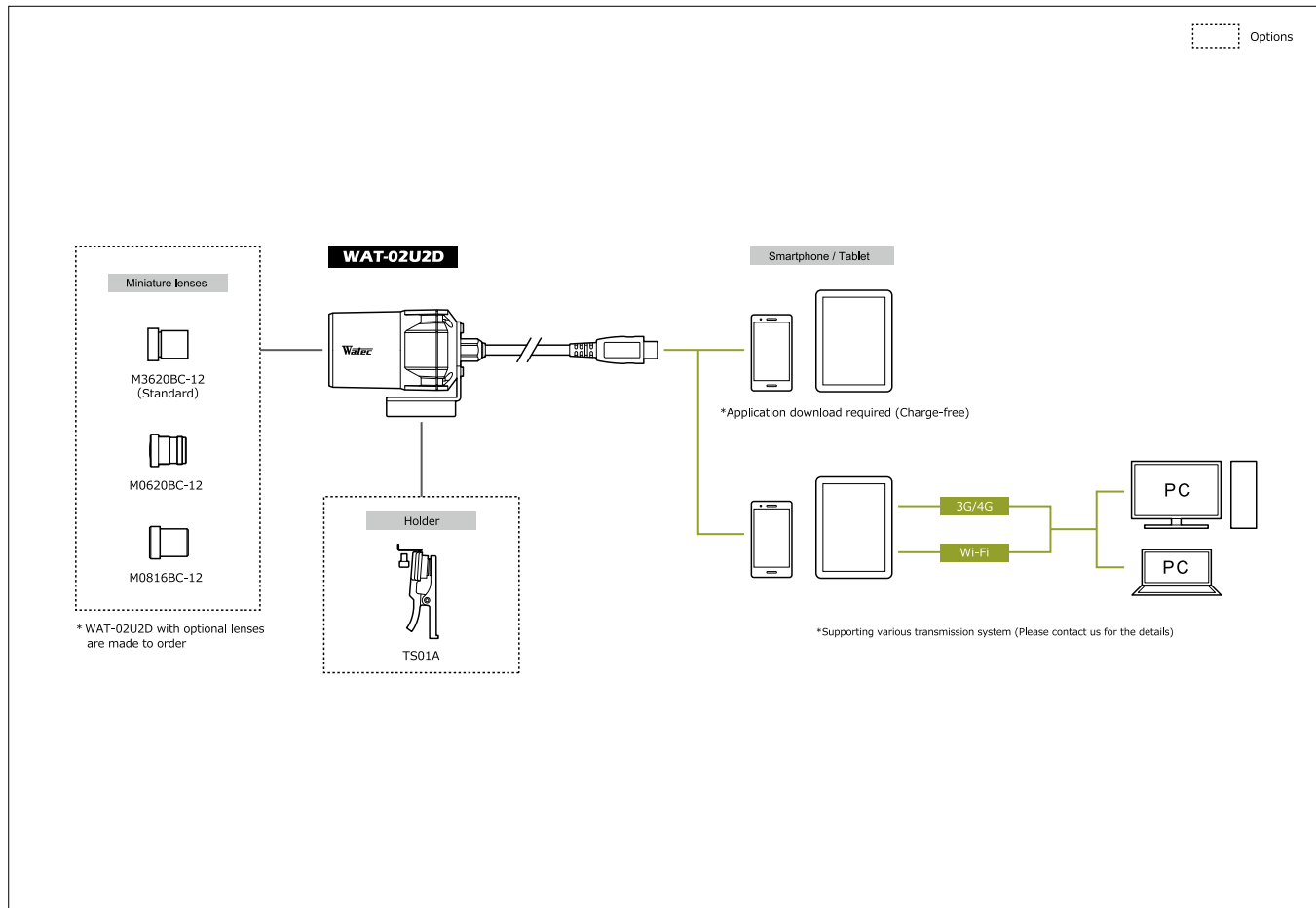
### Dimensions



### Specifications

Pick-up element	1/2.8 inch CMOS image sensor	
Number of effective pixels	1984(H) × 1225(V)	
Unit cell size	2.8μm(H) × 2.8μm(V)	
Imaging system	RGB primary color Bayer arrangement mosaic filters on chip	
Synchronizing system	Internal	
Scanning system	Progressive	
Output size	1920×1080, 1280×1024, 1280×800, 1280×720, 640×480, 320×240, 176×144, 160×120	
Max. frame rate	30 fps	
Video compression	MJPG, YUY2	
Video output	USB Video Class (Compatible)	
Resolution (H)	More than 680TVL (Center)	
Minimum illumination	0.5 lx F2.0 (AGC ON=42dB, Shutter=OFF)	
	0.25 lx F2.0 (AGC ON=42dB, Shutter=1/15 sec.)	
S/N	-	
Function settings	Camera Viewer	
AE mode	Fixed	1/15 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	ON
	OFF	-
MGC	0 - 24dB	
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 (High speed)	
Power supply	USB +5V	
Power consumption	0.6W (120mA)	
Operating temperature	-10 - +50°C	
Storage temperature	-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	-	
Min. System Requirements	CPU	800MHz or faster
	RAM	512MB or larger
	Others	USB2.0 Port
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 XP 32bit/64bit (SP2, 3), Windows Vista 32bit/64bit, Windows 7 32bit/64bit, Windows 8 32bit/64bit, Windows 8.1 32bit/64bit, Windows 10 32bit/64bit, Android 4.0 or newer	

### System diagram



# WAT-1200CS 1/3.2" High Sensitivity Miniature Camera with Day/Night

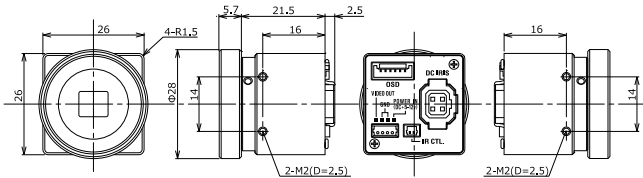
Day/Night camera for general surveillance



### 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 control

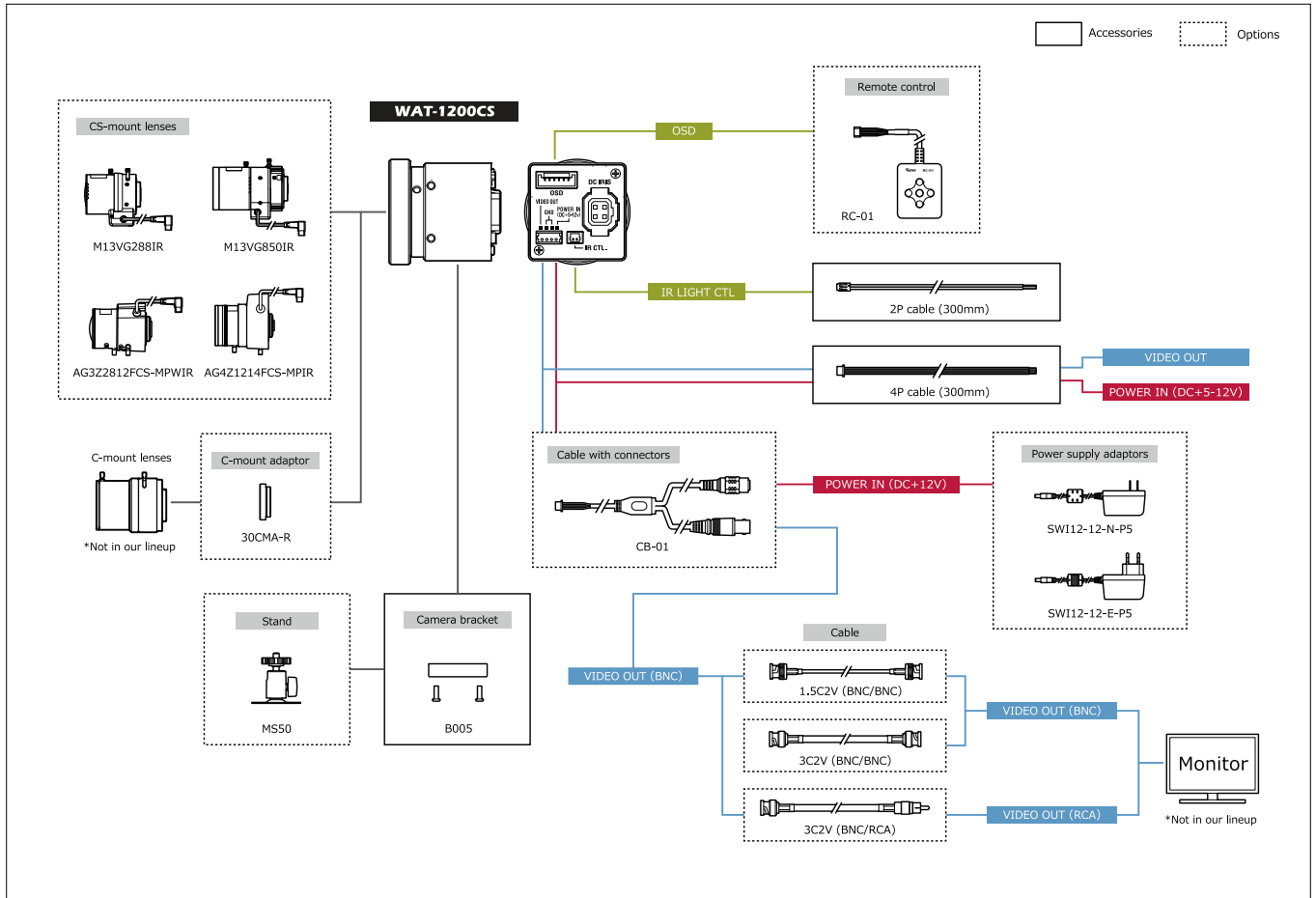
### Dimensions



### Specifications

		NTSC	PAL
Video standard		NTSC	PAL
Pick-up element		1/3.2 inch BSI CMOS image sensor	
Number of effective pixels		1280(H) × 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		0.002 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.
	EI	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.	
		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 control (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		AIC-G (Iris plug), 4P cable, 2P cable, Hex. wrench, B005 (Camera bracket)	

### System diagram



## WAT-233 1/3" True Day/Night Camera

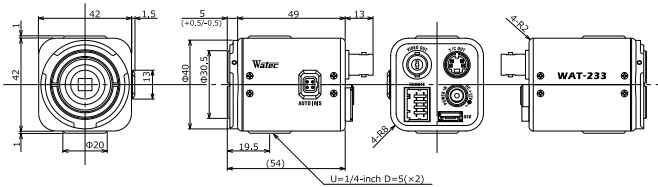
Day/Night and WDR offers the best solution for demanding scene conditions



### Key features

- 1/3-inch high Sensitivity 960H CCD sensor supports 650 TVL
- Wide dynamic range by adopting dual-shutter method
- 3DNR, privacy masking, defog, RS-485 (Pelco-D) compatible
- OSD (On Screen Display) – Easy installation through a remote control provided in kit

### Dimensions



## WAT-221S2 1/2" Multi-function & High Sensitivity Camera

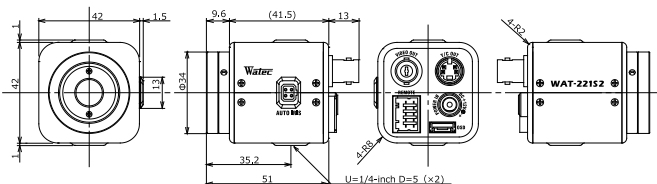
Advanced setting for general surveillance, embedded system and research study



### Key features

- 1/2-inch CCD sensor with high sensitivity
- Min. illumination 0.006 lx F1.2 (AGC HIGH=44dB, shutter=OFF, NR=ON)
- 3DNR, wide dynamic range, HSBLC (Highlight Suppression Back Light Compensation)
- White blemish correction, slow-shutter, privacy masking and RS-485 (Pelco-D) compatible
- OSD (On Screen Display) – Easy installation through a remote control provided in kit

### Dimensions



### Specifications

Video standard	PAL	
Pick-up element	1/3 inch interline transfer CCD image sensor	
Number of effective pixels	976(H) × 582(V)	
Unit cell size	5.0μm(H) × 6.25μm(V)	
Imaging system	Ye, Cy, Mg, and G complementary color mosaic filters on chip	
Synchronizing system	Internal	
Scanning system	2:1 interface	
Video outputs	Composite: 1.0 V(p-p) 75Ω (Unbalanced) Y/C OUT : Y: 1.0V(p-p), C: 0.3V(p-p) 75Ω	
Resolution (H)	More than 650TVL (Center)	
Minimum illumination	Color	0.01 lx F1.2 (AGC HIGH=44dB, Shutter=OFF, NR=ON) 0.0006 lx F1.2 (AGC HIGH=44dB, Shutter=x16, NR=ON)
	Monochrome	0.0005 lx F1.2 (AGC HIGH=44dB, Shutter=OFF, NR=ON) 0.00003 lx F1.2 (AGC HIGH=44dB, Shutter=x16, NR=ON)
S/N	More than 50dB (AGC OFF=2dB, γ=1.0)	
Function settings	OSD : Remote controller, RS-485 (Pelco-D), Communication : RS-485 (Pelco-D) x2, x4, x8, x16, x32, x64, x128, x256 (field)	
AE mode	Fixed	1/50, 1/120 sec.
	EI	1/250, 1/500, 1/1000, 1/2000, 1/4000, 1/10000 sec. 1/50 - 1/100000 sec. x16 - 1/100000 sec.
White balance	ATW, AWB, ACR, PWB, PRESET (3200K, 4300K, 5100K, 6300K)	
AGC	ON	2 - 32dB (LOW), 2 - 44dB (HIGH)
	OFF	2dB
MGC	2 - 44dB (1dB step)	
Day/Night	Mechanical Auto, Manual, External	
Gamma characteristics	γ=0.35, 0.4, 0.45, 0.5, 0.55, 0.6, 0.7, 0.8, 1.0	
Video level	Adjustable	
Noise reduction	3DNR OFF/ON Level adjustable	
Wide dynamic range	WDR OFF/ON Level adjustable	
Lens iris	Video / DC (EIA), Auto-select	
Back light compensation	BLC, HSBLC	
White blemish correction	Up to 64 pixels	
Sharpness	Level adjustable	
Defog	OFF/ON Level adjustable	
Digital zoom	ZOOM (x2 - x256), PAN/TILT	
Privacy mask	15 masks	
Mirror image	OFF, V-FLIP, H-FLIP, HV-FLIP	
Freeze	-	
Motion detection	OFF/ON Select from 96 detection areas	
Neg.image	-	
Interface	BNC (Composite Video), Y/C OUT, Power in, Remote control (RC-01), REMOTE (Alarm, DAY/NIGHT, RS-485)	
Power supply	DC+12V±10%	
Power consumption	1.62W (135mA)	
Operating temperature	-10 - +50°C	
Storage temperature	-30 - +70°C	
Operating / Storage humidity	95% RH or less (Without condensation)	
Lens mount	CS mount (Back focus adjustable)	
Weight	Approx. 150g	
Accessories	WPDC12 (DC plug), AIC-G (Iris plug), Hex. wrench, RC-01 (Remote control), I/O cable	

### Specifications

Video standard	PAL	
Pick-up element	1/2 inch interline transfer CCD image sensor	
Number of effective pixels	52(H) × 582(V)	
Unit cell size	8.6μm(H) × 8.3μm(V)	
Imaging system	Ye, Cy, Mg, and G complementary color mosaic filters on chip	
Synchronizing system	Internal	
Scanning system	2:1 interface	
Video outputs	Composite: 1.0 V(p-p) 75Ω (Unbalanced) Y/C OUT : Y: 1.0V(p-p), C: 0.3V(p-p) 75Ω	
Resolution (H)	More than 550TVL (Center)	
Minimum illumination	0.006 lx F1.2 (AGC HIGH=44dB, Shutter=OFF, NR=ON)	
	0.0004 lx F1.2 (AGC HIGH=44dB, Shutter=x16, NR=ON)	
S/N	More than 55dB (AGC OFF=-3dB, γ=1.0)	
Function settings	OSD : Remote controller, RS-485 (Pelco-D), Communication : RS-485 (Pelco-D) x2, x4, x8, x16, x32, x64, x128, x256 (field)	
AE mode	Fixed	1/50, 1/120 sec.
	EI	1/250, 1/500, 1/1000, 1/2000, 1/4000, 1/10000 sec. 1/50 - 1/100000 sec. x16 - 1/100000 sec.
White balance	ATW, AWB, ACR, PWB, PRESET (3200K, 4300K, 5100K, 6300K)	
AGC	ON	-3 - 32dB (LOW), -3 - 44dB (HIGH)
	OFF	-3dB
MGC	-3 - 44dB (1dB step)	
Day/Night	-	
Gamma characteristics	γ=0.35, 0.4, 0.45, 0.5, 0.55, 0.6, 0.7, 0.8, 1.0	
Video level	Adjustable	
Noise reduction	3DNR OFF/ON Level adjustable	
Wide dynamic range	D-WDR OFF/ON Level adjustable	
Lens iris	Video / DC (EIA), Auto-select	
Back light compensation	BLC, HSBLC	
White blemish correction	Up to 64 pixels	
Sharpness	Level adjustable	
Defog	OFF/ON Level adjustable	
Digital zoom	ZOOM (x2 - x256), PAN/TILT	
Privacy mask	4 masks	
Mirror image	OFF, V-FLIP, H-FLIP, HV-FLIP	
Freeze	-	
Motion detection	OFF/ON Select from 96 detection areas	
Neg.image	-	
Interface	BNC (Composite Video), Y/C OUT, Power in, Remote control (RC-01), REMOTE (Alarm, RS-485)	
Power supply	DC+12V±10%	
Power consumption	1.32W (110mA)	
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. 150g	
Accessories	WPDC12 (DC plug), AIC-G (Iris plug), Hex. wrench, RC-01 (Remote control), I/O cable	



# WAT-231S2 1/3" High Sensitivity Camera

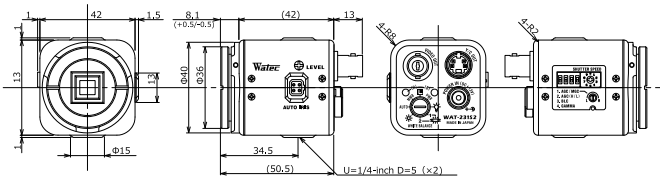
Multi-function and High-performance model



### Key features

- 1/3-inch CCD sensor with high sensitivity 0.02 lx F1.2 and resolution 540TVL
- Versatile use for general surveillance, microscope application and embedded system
- Flicker suppression electric iris controls flicker and exposure at the same time
- White balance, white blemish correction, back light compensation

### Dimensions



### Specifications

Video standard	PAL	
Pick-up element	1/3 inch interline transfer CCD image sensor	
Number of effective pixels	752(H) × 582(V)	
Unit cell size	6.5µm(H) × 6.25µm(V)	
Imaging system	Ye, Cy, Mg, and G complementary color mosaic filters on chip	
Synchronizing system	Internal	
Scanning system	2:1 interface	
Video outputs	Composite: 1.0 V(p-p) 75Ω (Unbalanced) Y/C OUT : Y: 1.0V(p-p), C: 0.3V(p-p) 75Ω	
Resolution (H)	More than 540TVL (Center)	
Minimum illumination	0.02 lx F1.2 (AGC HIGH=38dB, Shutter=OFF)	
S/N	More than 50dB (AGC OFF=0dB, γ=1.0)	
Function settings	DIP Switch	
AE mode	Fixed	1/50, 1/120 sec.
	EI	1/250, 1/500, 1/1000, 1/2000, 1/4000, 1/10000 sec.
		1/50 - 1/1000000 sec.
White balance	ATW, PWB, MWB, PRESET (3200K, 4300K, 5100K, 6300K)	
AGC	ON	0 - 32dB (LOW), 0 - 38dB (HIGH)
	OFF	0dB
MGC	0 - 32dB	
Day/Night	-	
Gamma characteristics	γ=0.45, 1.0	
Video level	95IRE	
Noise reduction	-	
Wide dynamic range	-	
Lens iris	Video / DC (EIA), Auto-select	
Back light compensation	BLC	
White blemish correction	Up to 32 pixels	
Sharpness	-	
Defog	-	
Digital zoom	-	
Privacy mask	-	
Mirror image	-	
Freeze	-	
Motion detection	-	
Neg.image	-	
Interface	BNC (Composite Video), Y/C OUT, Power in	
Power supply	DC+12V±10%	
Power consumption	1.92W (160mA)	
Operating temperature	-10 - +50°C	
Storage temperature	-30 - +70°C	
Operating / Storage humidity	95% RH or less (Without condensation)	
Lens mount	CS mount (Back focus adjustable)	
Weight	Approx. 140g	
Accessories	WPDC12 (DC plug), AIC-G (Iris plug), Hex. wrench	

# WAT-250D2 1/3" Compact & High Sensitivity Camera

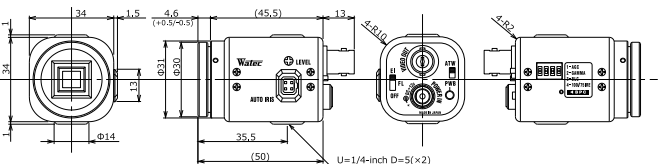
Compact design with all the necessary features inside



### Key features

- Min. illumination 0.02 lx F1.2 (AGC ON=38dB, Shutter=OFF)
- Color-rollingless AWB mode under fluorescent light
- Versatile use for general surveillance, embedded system and part of image processing system
- Flicker suppression electric Iris controls flicker and exposure at the same time
- Selectable white balance and video level, back light compensation & white blemish correction

### Dimensions



### Specifications

Video standard	PAL	
Pick-up element	1/3 inch interline transfer CCD image sensor	
Number of effective pixels	752(H) × 582(V)	
Unit cell size	6.5µm(H) × 6.25µm(V)	
Imaging system	Ye, Cy, Mg, and G complementary color mosaic filters on chip	
Synchronizing system	Internal	
Scanning system	2:1 interface	
Video output	Composite: 1.0 V(p-p) 75Ω (Unbalanced)	
Resolution (H)	More than 540TVL (Center)	
Minimum illumination	0.02 lx F1.2 (AGC ON=38dB, Shutter=OFF)	
S/N	More than 50dB (AGC OFF=0dB, γ=1.0)	
Function settings	DIP Switch	
AE mode	Fixed	1/50, 1/120 sec.
	EI	1/50 - 1/1000000 sec.
White balance	ATW, PWB	
AGC	ON	0 - 38dB
	OFF	0dB
MGC	-	
Day/Night	-	
Gamma characteristics	γ=0.45, 1.0	
Video level	75IRE, 100IRE	
Noise reduction	-	
Wide dynamic range	-	
Lens iris	Video / DC (EIA), Auto-select	
Back light compensation	BLC	
White blemish correction	Up to 32 pixels	
Sharpness	-	
Defog	-	
Digital zoom	-	
Privacy mask	-	
Mirror image	-	
Freeze	-	
Motion detection	-	
Neg.image	-	
Interface	BNC (Composite Video), Power in	
Power supply	DC+12V±10%	
Power consumption	1.74W (145mA)	
Operating temperature	-10 - +50°C	
Storage temperature	-30 - +70°C	
Operating / Storage humidity	95% RH or less (Without condensation)	
Lens mount	CS mount (Back focus adjustable)	
Weight	Approx. 86g	
Accessories	WPDC12 (DC plug), AIC-G (Iris plug), Hex. wrench	

# WAT-600CX 1/3" One-cable System High Sensitivity Camera

Coaxial video transmission system makes CCTV installation much easier

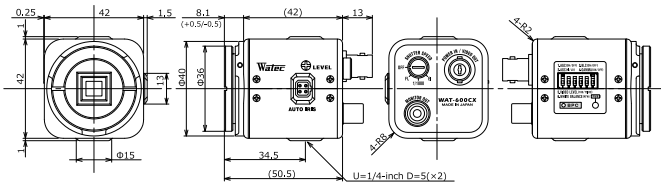


\* No CE & FCC

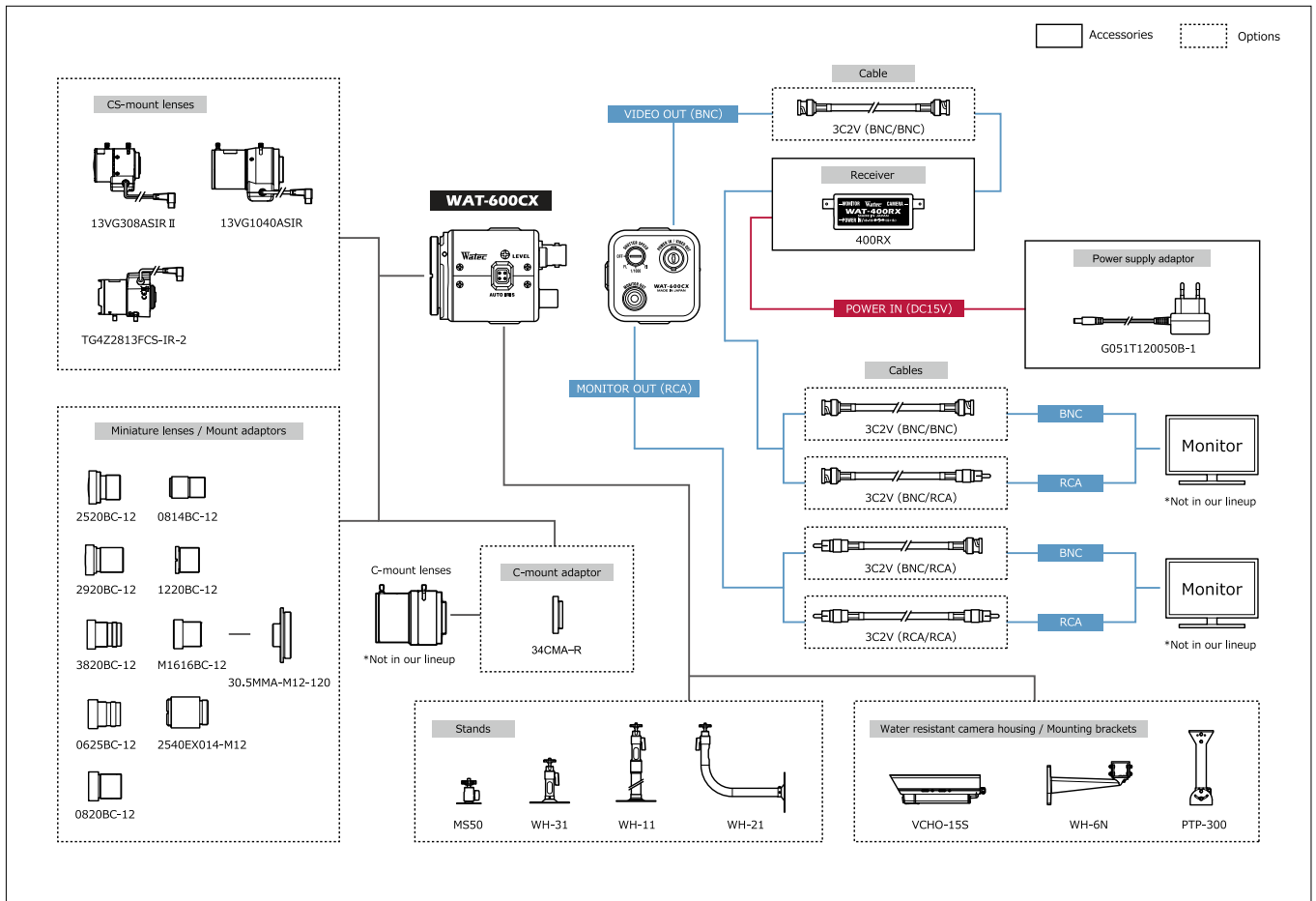
### Key features

- 1/3-inch CCD sensor with high sensitivity 0.02 lx F1.2 and resolution 540TVL
- RCA video out for checking image at construction stage
- Color-rollingless AWB mode under fluorescent light
- Flicker suppression electric Iris controls flicker and exposure at the same time
- Selectable white balance and video level, back light compensation and white blemish correction

### Dimensions



### System diagram



### Specifications

Video standard	PAL	
Pick-up element	1/3 inch interline transfer CCD image sensor	
Number of effective pixels	752(H) x 582(V)	
Unit cell size	6.5µm(H) x 6.25µm(V)	
Imaging system	Ye, Cy, Mg, and G complementary color mosaic filters on chip	
Synchronizing system	Internal	
Scanning system	2:1 Interlace	
Video outputs	Composite: 1.0 V(p-p) 75Ω (Unbalanced) VIDEO OUT / POWER IN	
Resolution (H)	More than 540TVL (Center)	
Minimum illumination	0.02 lx F1.2 (AGC HIGH=38dB, Shutter=OFF)	
S/N	More than 50dB (AGC OFF=0dB, γ=1.0)	
Function settings	DIP Switch	
AE mode	Fixed	1/50, 1/120 sec.
	EI	1/1000 sec.
White balance	ATW, PWB	
	AGC	ON
	OFF	0dB
MGC	-	
Day/Night	-	
Gamma characteristics	γ=0.45, 1.0	
Video level	75IRE, 100IRE	
Noise reduction	-	
Wide dynamic range	-	
Lens iris	Video / DC (EIA), Auto-select	
Back light compensation	BLC	
White blemish correction	Up to 32 pixels	
Sharpness	-	
Defog	-	
Digital zoom	-	
Privacy mask	-	
Mirror image	-	
Freeze	-	
Motion detection	-	
Neg. image	-	
Interface	BNC (Composite Video, Power in), RCA (Composite Video)	
Power supply	DC+15V	
Power consumption	3.3W (220mA) *3C-2V 150m	
Operating temperature	-10 - +50°C	
Storage temperature	-30 - +70°C	
Operating / Storage humidity	95% RH or less (Without condensation)	
Lens mount	CS mount (Back focus adjustable)	
Cable length	3C-2V (Max. 150m) *Max. 100m with auto iris lens	
Weight	Approx. 140g	
Accessories	Receiver (WAT-400RX), Power supply adaptor, DC conversion plug, AIC-G (Iris plug), Hex. wrench	

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

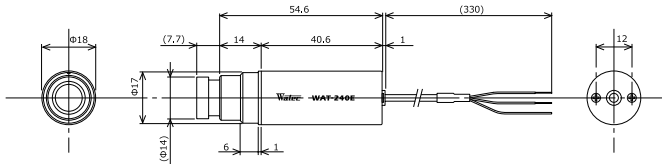
Compact cylindrical camera with Built-in lens



### 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



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

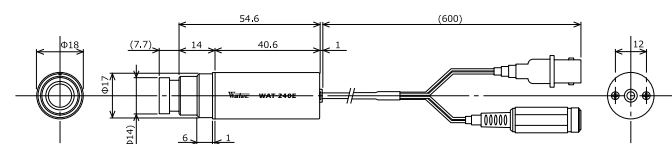
Compact cylindrical camera with Built-in lens & BNC output



### 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		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	

### 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

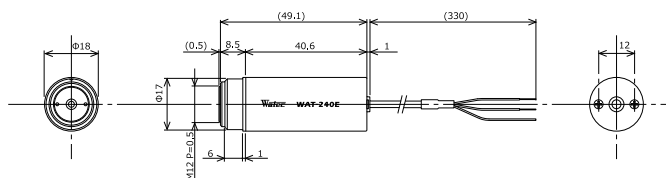
Compact cylindrical camera with Built-in lens



### Key features

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

### Dimensions



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

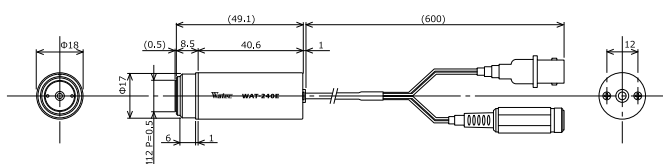
Compact cylindrical camera with Built-in lens & BNC output



### Key features

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

### Dimensions



### Specifications

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		-	
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. 18g	
Accessories		Ring holder	

### Specifications

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		-	
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. 28g	
Accessories		Ring holder	

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

Function setting controllable WAT-240E

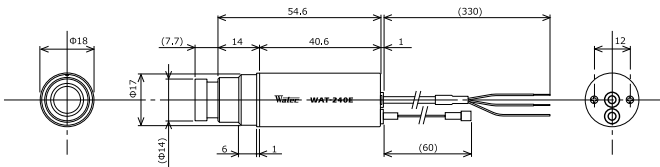


\* No CE & FCC

### 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

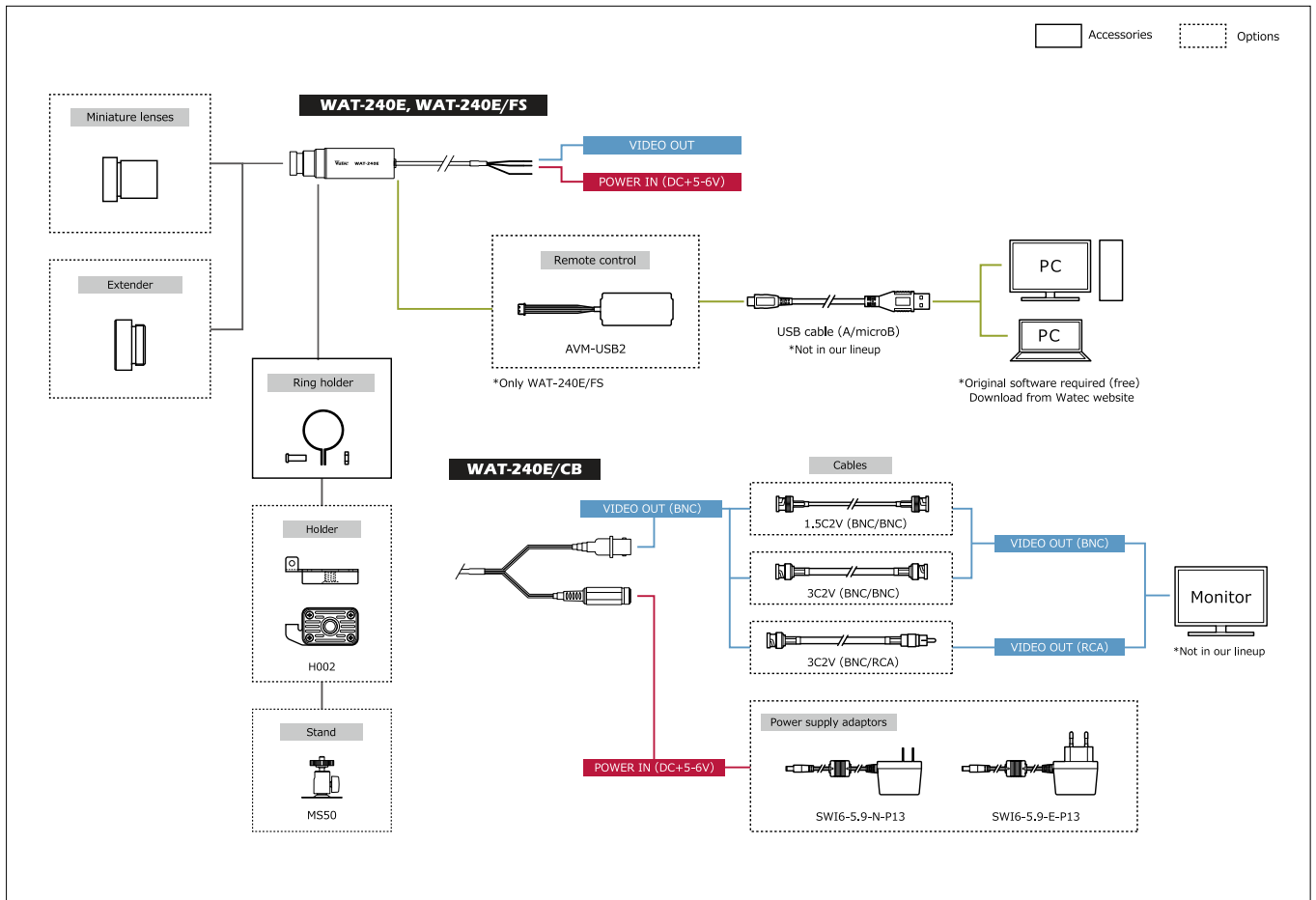
### Dimensions



### 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.	
		1/60 - 1/100000 (Max.1/60 - 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 control)	
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-230V2 (G3.6) 1/4" Miniature Camera

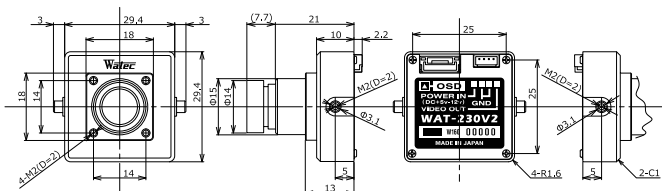
Ultra-compact design for easy installation and limited space



### Key features

- High resolution of 650TVL
- Min.illumination 0.1 lx F2.0 (AGC ON=45dB, Shutter=OFF)
- Wide input voltage range (\*DC +5V - 12V)
- Advanced setting available by OSD (On Screen Display) through an optional remote control
- Various optional M12 lenses available \*Glass lenses and pinhole lens are not interchangeable

### Dimensions



### Specifications

Video standard	PAL	
Pick-up element	1/4 inch interline transfer CCD image sensor	
Number of effective pixels	976(H) x 582(V)	
Unit cell size	3.75μm(H) x 4.69μm(V)	
Imaging system	Ye, Cy, Mg, and G complementary color mosaic filters on chip	
Synchronizing system	Internal	
Scanning system	2:1 interlace	
Video outputs	Composite: 1.0 V(p-p) 75Ω (Unbalanced)	
Resolution (H)	More than 650TVL (Center)	
Minimum illumination	0.1 lx F2.0 (AGC ON=45dB, Shutter=OFF)	
S/N	More than 50dB (AGC OFF=0dB, γ=0.45)	
Function settings	OSD : Remote controller	
AE mode	Fixed	1/50, 1/120 sec.
	EI	1/250, 1/500, 1/1000, 1/2000, 1/4000, 1/10000 sec.
AGC	ON	0 - 45dB
	OFF	0dB
MGC		0 - 42dB (6dB step)
Day/Night		Digital Auto, Manual
Gamma characteristics		γ=0.45
Video level		Adjustable
Noise reduction		2DNR OFF/ON Level adjustable
Wide dynamic range		D-WDR OFF/ON Level adjustable
Lens iris		-
Back light compensation		BLC, HSBLC
White blemish correction		Up to 64 pixels
Sharpness		Level adjustable
Defog		OFF/ON Level adjustable
Digital zoom		-
Privacy mask		8 masks
Mirror image		OFF, H-FLIP
Freeze		-
Motion detection		-
Neg.image		-
Interface		4P connector (Composite Video, Power in), Remote control (RC-01)
Power supply		DC+5V - 12V
Power consumption		0.775W/155mA (DC+5V), 0.78W/65mA (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. 35g
Accessories		4P cable

# WAT-230V2 (P3.7) 1/4" Miniature Camera

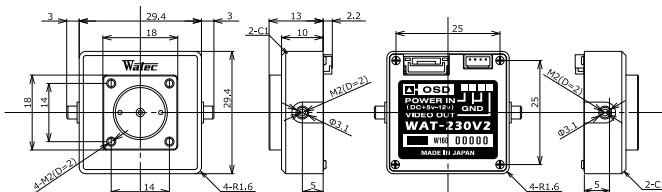
Ultra-compact design for easy installation and limited space



### Key features

- Wide input voltage range (\*DC +5V - 12V)
- Advanced setting available by OSD (On Screen Display) through an optional remote control
- \*Glass lenses and pinhole lens are not interchangeable

### Dimensions



### Specifications

Video standard	PAL	
Pick-up element	1/4 inch interline transfer CCD image sensor	
Number of effective pixels	976(H) x 582(V)	
Unit cell size	3.75μm(H) x 4.69μm(V)	
Imaging system	Ye, Cy, Mg, and G complementary color mosaic filters on chip	
Synchronizing system	Internal	
Scanning system	2:1 interlace	
Video outputs	Composite: 1.0 V(p-p) 75Ω (Unbalanced)	
Resolution (H)	More than 650TVL (Center)	
Minimum illumination	0.6 lx F4.5 (AGC ON=45dB, Shutter=OFF)	
S/N	More than 50dB (AGC OFF=0dB, γ=0.45)	
Function settings	OSD : Remote controller	
AE mode	Fixed	1/50, 1/120 sec.
	EI	1/250, 1/500, 1/1000, 1/2000, 1/4000, 1/10000 sec.
AGC	ON	0 - 45dB
	OFF	0dB
MGC		0 - 42dB (6dB step)
Day/Night		Digital Auto, Manual
Gamma characteristics		γ=0.45
Video level		Adjustable
Noise reduction		2DNR OFF/ON Level adjustable
Wide dynamic range		D-WDR OFF/ON Level adjustable
Lens iris		-
Back light compensation		BLC, HSBLC
White blemish correction		Up to 64 pixels
Sharpness		Level adjustable
Defog		OFF/ON Level adjustable
Digital zoom		-
Privacy mask		8 masks
Mirror image		OFF, H-FLIP
Freeze		-
Motion detection		-
Neg.image		-
Interface		4P connector (Composite Video, Power in), Remote control (RC-01)
Power supply		DC+5V - 12V
Power consumption		0.775W/155mA (DC+5V), 0.78W/65mA (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. 27g
Accessories		4P cable

# WAT-230V2/CS 1/4" Miniature Camera

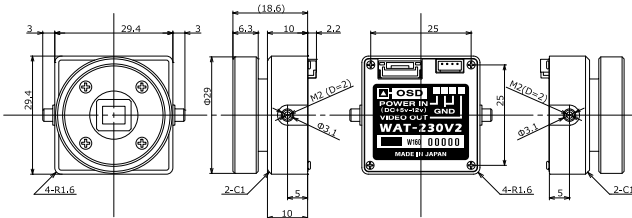
Ultra-compact design for easy installation and limited space



### Key features

- High resolution of 650TVL
- Min.illumination 0.05 lx F1.2 (AGC ON=45dB, Shutter=OFF)
- Wide input voltage range (\*DC +5V - 12V)
- Advanced setting available by OSD (On Screen Display) through an optional remote control

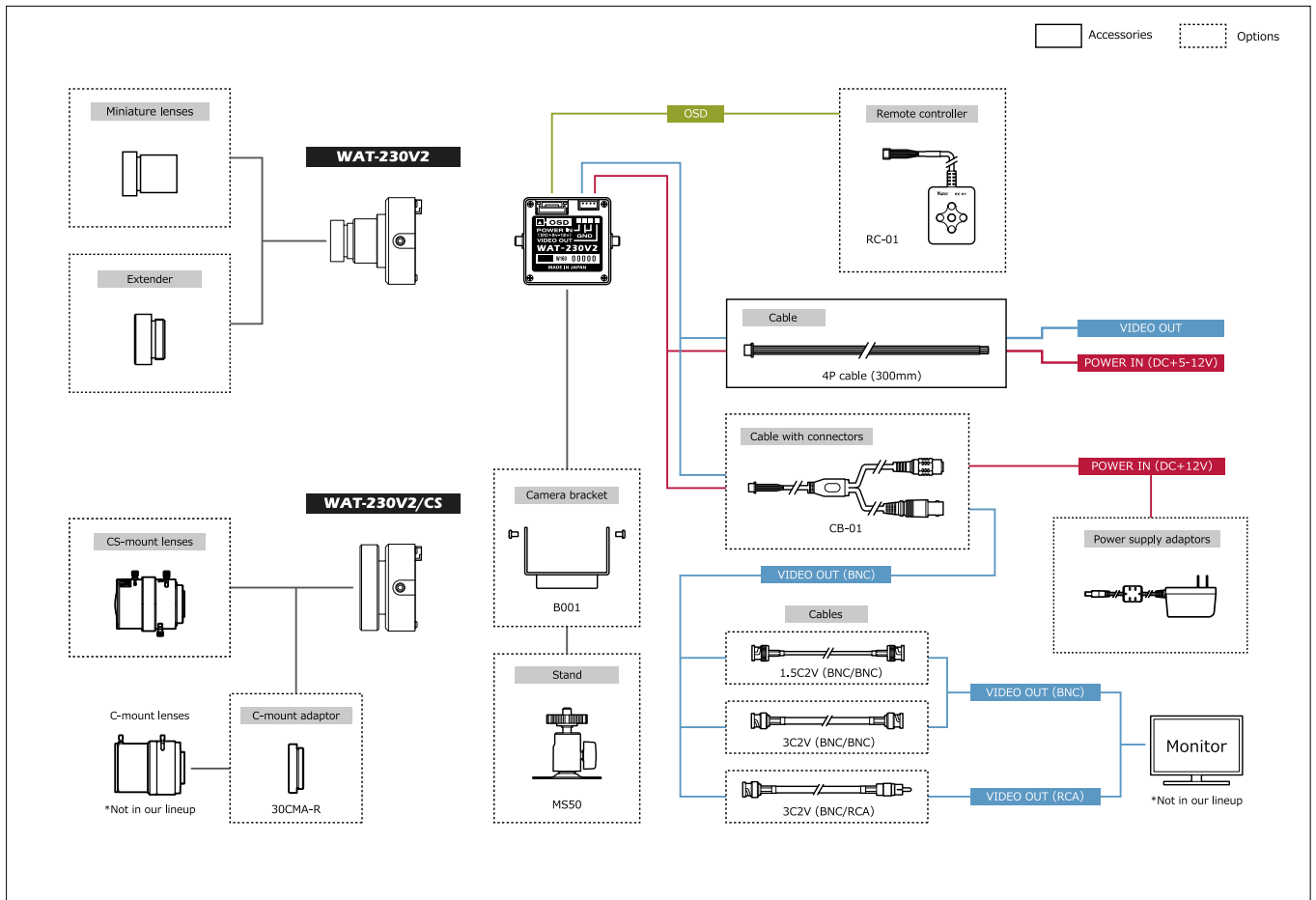
### Dimensions



### Specifications

Video standard	PAL	
Pick-up element	1/4 inch interline transfer CCD image sensor	
Number of effective pixels	976(H) × 582(V)	
Unit cell size	3.75μm(H) × 4.69μm(V)	
Imaging system	Ye, Cy, Mg, and G complementary color mosaic filters on chip	
Synchronizing system	Internal	
Scanning system	2:1 interlace	
Video outputs	Composite: 1.0 V(p-p) 75Ω (Unbalanced)	
Resolution (H)	More than 650TVL (Center)	
Minimum illumination	0.05 lx F1.2 (AGC ON=45dB, Shutter=OFF)	
S/N	More than 50dB (AGC OFF=0dB, γ=0.45)	
Function settings	OSD - Remote controller	
AE mode	Fixed	1/50, 1/120 sec.
	EI	1/250, 1/500, 1/1000, 1/2000, 1/4000, 1/10000 sec.
		1/50 - 1/100000 sec.
White balance	ATW, AWB, ACR, PWB, MWB, PRESET (5100K, 6300K)	
AGC	ON	0 - 45dB
	OFF	0dB
MGC	0 - 42dB (6dB step)	
Day/Night	Digital Auto, Manual	
Gamma characteristics	γ±0.45	
Video level	Adjustable	
Noise reduction	2DNR OFF/ON Level adjustable	
Wide dynamic range	D-WDR OFF/ON Level adjustable	
Lens iris	-	
Back light compensation	BLC, HSBLC	
White blemish correction	Up to 64 pixels	
Sharpness	Level adjustable	
Defog	OFF/ON Level adjustable	
Digital zoom	-	
Privacy mask	8 masks	
Mirror image	OFF, H-FLIP	
Freeze	-	
Motion detection	-	
Neg. image	-	
Interface	4P connector (Composite Video, Power in), Remote control (RC-01)	
Power supply	DC+5V - 12V	
Power consumption	0.775W/155mA (DC+5V), 0.78W/65mA (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. 28g	
Accessories	4P cable	

### System diagram Representative connection example of the WAT-230V2 series



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

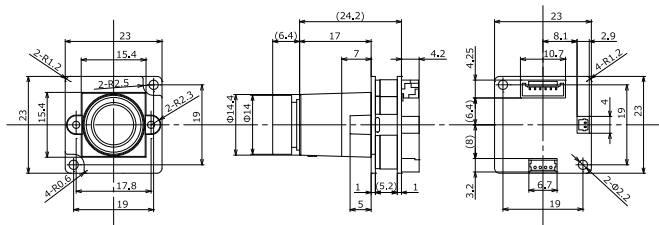
Day/Night board camera for general surveillance



### 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 control
- 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 (P3.3) 1/3.2" High Sensitivity Miniature Board Day/Night Camera

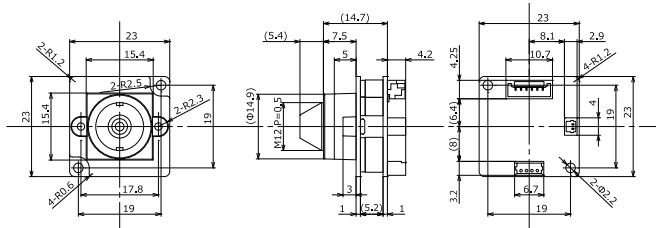
Day/Night board camera for general surveillance



### Key features

- Ultra-compact design only 23 x 23 x 25 mm
- Wide dynamic range, ICR Mechaless Day/Night function
- Advanced setting available by OSD (On Screen Display) through an optional remote control
- 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) 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		0.005 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.
	EI	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.	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 ctrl), Remote control(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) 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		0.009 lx F2.4 (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.
	EI	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.	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 ctrl), Remote control (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		3324B-12P(A) (F3.3 F2.4)	
Weight		Approx. 8g	
Accessories		4P cable, 2P cable	



## W-03CDB3 1/3" Multi-function Board Camera with CS Lens Mount

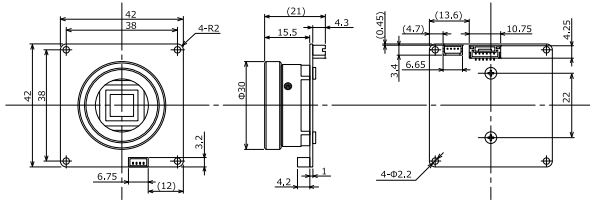
High functionality and high sensitivity for demanding scene conditions



### Key features

- 1/3-inch CCD sensor with high sensitivity 0.005 lx F1.2 and resolution 650TVL
- Advanced setting available by OSD (On Screen Display) through an optional remote control
- 2DNR, privacy masking, BLC (Back Light Compensation)
- Mirror image, white blemish correction, contour correction
- Manual iris lens, video drive iris lens and DC drive iris lens compatible

### Dimensions



## W-04CDB3 1/3" Multi-function Board Camera with Varifocal Lens

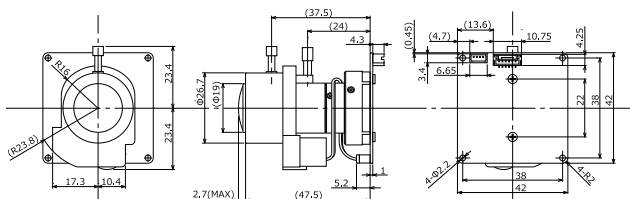
High functionality and high sensitivity for demanding scene conditions



### Key features

- 1/3-inch CCD sensor with high sensitivity 0.005 lx F1.2 and resolution 650TVL
- Advanced setting available by OSD (On Screen Display) through an optional remote control
- 2DNR, privacy masking, BLC (Back Light Compensation)
- Mirror image, white blemish correction, contour correction
- Built-in vari-focal lens (f=2.8 – 10.5mm)

### Dimensions



### Specifications

Video standard		NTSC	PAL
Pick-up element		1/3 inch interline transfer CCD image sensor	
Number of effective pixels		976(H) × 494(V)	976(H) × 582(V)
Unit cell size		5.4µm(H) × 7.4µm(V)	5.0µm(H) × 6.25µm(V)
Imaging system		Ye, Cy, Mg, and G complementary color mosaic filters on chip	
Synchronizing system		Internal	
Scanning system		2:1 Interlace	
Video output		Composite: 1.0 V(p-p) 75Ω (Unbalanced)	
Resolution (H)		More than 650TVL (Center)	
Minimum illumination		0.005 lx F1.2 (AGC ON=45dB, Shutter=OFF)	
S/N		More than 52dB (AGC OFF=-3dB, γ=0.45)	
Function settings		OSD : Remote controller	
AE mode	Fixed	1/60, 1/100 sec.	1/50, 1/120 sec.
	EI	1/250, 1/500, 1/1000, 1/2000, 1/4000, 1/10000 sec.	
		1/60 - 1/100000 sec.	1/50 - 1/100000 sec.
White balance		ATW, AWB, ACR, PWB, MWB, PRESET (5100K, 6300K)	
AGC	ON	-3 - 45dB	
	OFF	-3dB	
MGC		0 - 42dB (6dB step)	
Day/Night		Digital Auto, Manual	
Gamma characteristics		γ=0.45	
Video level		Adjustable	
Noise reduction		2DNR OFF/ON Level adjustable	
Wide dynamic range		D-WDR OFF/ON Level adjustable	
Lens iris		Video / DC	
Back light compensation		BLC, HSBLIC	
White blemish correction		Up to 64 pixels	
Sharpness		Level adjustable	
Defog		OFF/ON Level adjustable	
Digital zoom		-	
Privacy mask		8 masks	
Mirror image		OFF, H-FLIP	
Freeze		-	
Motion detection		-	
Neg,image		-	
Interface		4P connector (Composite Video, Power in), 4P connector (DC iris), Remote control (RC-01)	
Power supply		DC+12V±10%	
Power consumption		0.78W (65mA)	
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. 29g	
Accessories		4P cable, IRIS cable, Hex. Wrench	

### Specifications

Video standard		NTSC	PAL
Pick-up element		1/3 inch interline transfer CCD image sensor	
Number of effective pixels		976(H) × 494(V)	976(H) × 582(V)
Unit cell size		5.4µm(H) × 7.4µm(V)	5.0µm(H) × 6.25µm(V)
Imaging system		Ye, Cy, Mg, and G complementary color mosaic filters on chip	
Synchronizing system		Internal	
Scanning system		2:1 Interlace	
Video output		Composite: 1.0 V(p-p) 75Ω (Unbalanced)	
Resolution (H)		More than 650TVL (Center)	
Minimum illumination		0.005 lx F1.2 (AGC ON=45dB, Shutter=OFF)	
S/N		More than 52dB (AGC OFF=-3dB, γ=0.45)	
Function settings		OSD : Remote controller	
AE mode	Fixed	1/60, 1/100 sec.	1/50, 1/120 sec.
	EI	1/250, 1/500, 1/1000, 1/2000, 1/4000, 1/10000 sec.	
		1/60 - 1/100000 sec.	1/50 - 1/100000 sec.
White balance		ATW, AWB, ACR, PWB, MWB, PRESET (5100K, 6300K)	
AGC	ON	-3 - 45dB	
	OFF	-3dB	
MGC		0 - 42dB (6dB step)	
Day/Night		Digital Auto, Manual	
Gamma characteristics		γ=0.45	
Video level		Adjustable	
Noise reduction		2DNR OFF/ON Level adjustable	
Wide dynamic range		D-WDR OFF/ON Level adjustable	
Lens iris		Video / DC	
Back light compensation		BLC, HSBLIC	
White blemish correction		Up to 64 pixels	
Sharpness		Level adjustable	
Defog		OFF/ON Level adjustable	
Digital zoom		-	
Privacy mask		8 masks	
Mirror image		OFF, H-FLIP	
Freeze		-	
Motion detection		-	
Neg,image		-	
Interface		4P connector (Composite Video, Power in), 4P connector (DC iris), Remote control (RC-01)	
Power supply		DC+12V±10%	
Power consumption		1.02W (85mA)	
Operating temperature		-10 - +50°C	
Storage temperature		-30 - +70°C	
Operating / Storage humidity		95% RH or less (Without condensation)	
Lens mount		Ø14mm	
Standard lens		f=2.8mm - 10.5mm F1.2 (2.8) Varifocal lens	
Weight		Approx. 54g	
Accessories		4P cable, Hex. Wrench	

# WAT-400D2

1/3" Waterproof One-cable Camera

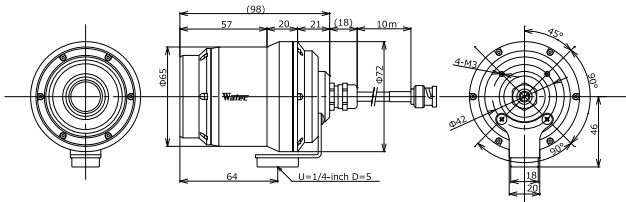
Camera, housing, lens, cable, & power supply in 1 package - all ready to install !



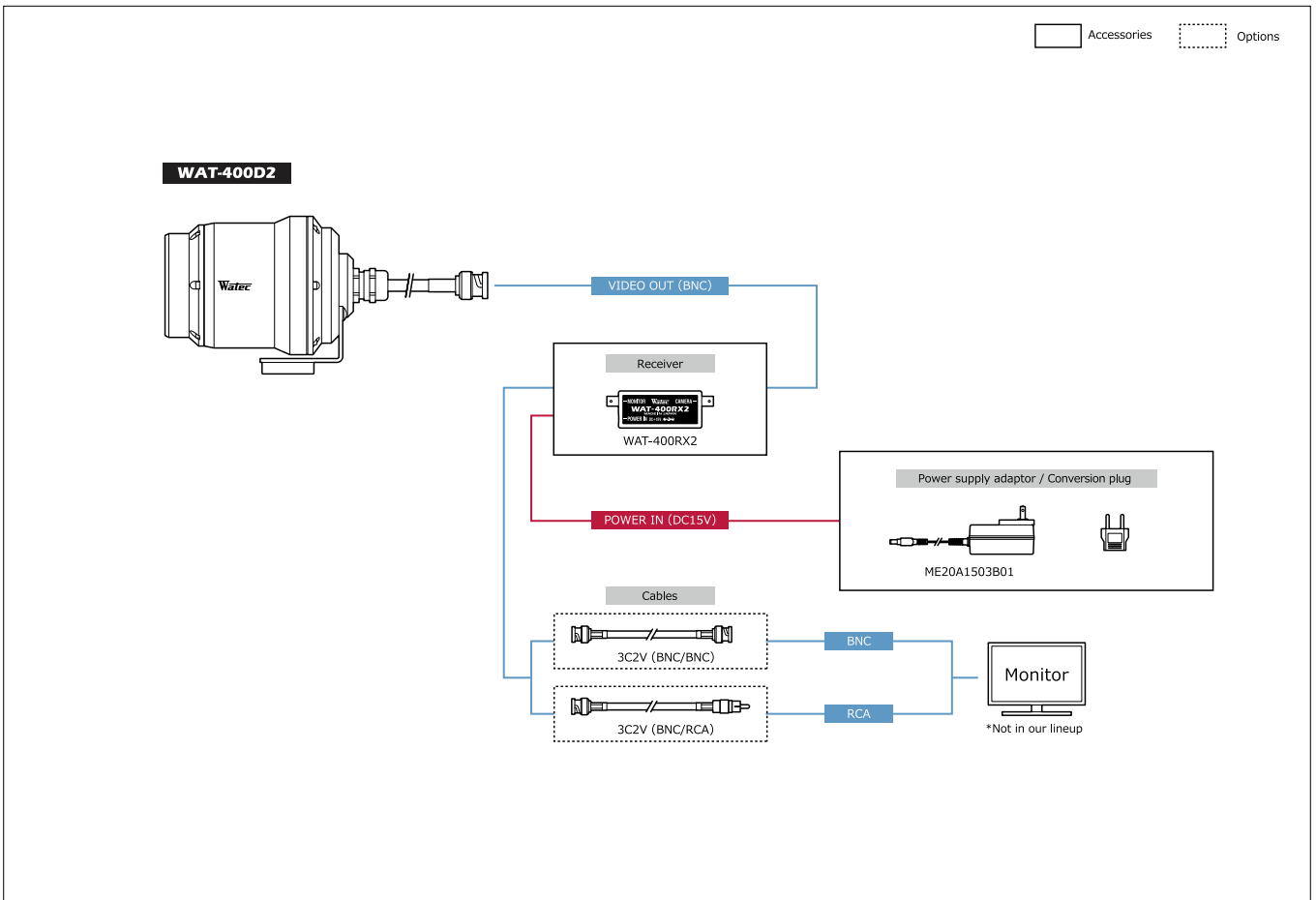
### Key features

- Water protection grade IPX8 (10m)
- Durable aluminum housing (stainless steel housing \*MTO)
- One cable system provides simple cable wiring
- Improved sensitivity, Min. illumination 0.005lx (was 0.15lx w/ 400D)
- Various function settings available to order (AE mode, white balance, gain control, BLC, etc.)
- Focal length selectable from f2.8 to f10.5 (f2.8: standard, other: MTO)

### Dimensions



### System diagram



### Specifications

Video standard		NTSC	PAL
Pick-up element		1/3 inch interline transfer CCD image sensor	
Number of effective pixels		976(H) × 494(V)	976(H) × 582(V)
Unit cell size		5.4μm(H) × 7.4μm(V)	5.0μm(H) × 6.25μm(V)
Imaging system		Ye, Cy, Mg, and G complementary color mosaic filters on chip	
Synchronizing system		Internal	
Scanning system		2:1 Interlace	
Video output		Composite: 1.0 V(p-p) 75Ω (Unbalanced)	
Resolution (H)		More than 650TVL (Center)	
Minimum illumination		0.005 lx F1.2 (AGC ON=45dB, Shutter=OFF)	
S/N		More than 52dB (AGC OFF=-3dB, γ=0.45)	
Function settings		-	
AE mode	Fixed	-	
	EI	1/60 - 1/100000 sec.	1/50 - 1/100000 sec.
White balance		ATW	
AGC	ON	-3 - 45dB	
	OFF	-	
MGC		-	
Day/Night		OFF	
Gamma characteristics		γ=0.45	
Video level		92.5IRE	85IRE
Noise reduction		2DNR ON	
Wide dynamic range		OFF	
Lens iris		DC	
Back light compensation		BLC	
White blemish correction		-	
Sharpness		ON	
Defog		OFF	
Digital zoom		-	
Privacy mask		OFF	
Mirror image		OFF	
Freeze		-	
Motion detection		-	
Neg. image		-	
Interface		BNC (Composite Video, Power in)	
Power supply		DC+15V±10%	
Power consumption		1.8W (120mA)	
Operating temperature		-10 - +50°C	
Storage temperature		-30 - +70°C	
Operating / Storage humidity		95% RH or less (Without condensation)	
Standard lens		f=2.8mm F1.2 (f=2.8mm - 10.5mm F1.2 (2.8) Varifocal lens)	
Cable length		3C-2V 10m (Max, 200m)	
Weight		Approx. 900g	
Accessories		Receiver (WAT-400RX2), Power supply adaptor, Conversion plug (TI-64)	

\*Various function controls are available on request. Please contact Watec or your supplier for details

# WAT-910HX 1/2" NIR Sensitivity Camera

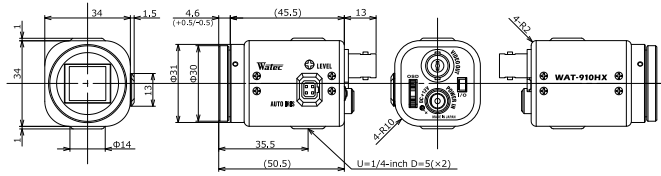
Achieves minimum illumination performance by 1/2-inch high sensitive CCD sensor and our unique circuit design



### Key features

- Min. illumination 0.0000025 lx F1.4 (AGC HIGH=41dB, Shutter=x256,  $\gamma=0.35$ , NR=ON)
- High quality image without noise under poor light condition
- Advanced setting available by OSD (On Screen Display) through jog dial on camera

### Dimensions



# WAT-910HX/RC 1/2" NIR Sensitivity Camera

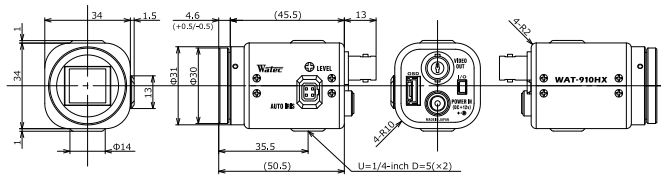
Achieves minimum illumination performance by 1/2-inch high sensitive CCD sensor and our unique circuit design



### Key features

- Min. illumination 0.0000025 lx F1.4 (AGC HIGH=41dB, Shutter=x256,  $\gamma=0.35$ , NR=ON)
- High quality image without noise under poor light condition
- Advanced setting available by OSD (On Screen Display) through a remote control provided in kit
- RS-485 and 1/3" available \*MTO

### Dimensions



### Specifications

Video standard		EIA	CCIR
Pick-up element		1/2 inch interline transfer CCD image sensor	
Number of effective pixels		768(H) x 494(V)	752(H) x 582(V)
Unit cell size		8.4 $\mu$ m(H) x 9.8 $\mu$ m(V)	8.6 $\mu$ m(H) x 8.3 $\mu$ m(V)
Synchronizing system		Internal	
Scanning system		2:1 interlace	
Video output		Composite video, 1.0 V(p-p) 75 $\Omega$ (Unbalanced)	
Resolution (H)		More than 570TVL (Center)	
Minimum illumination		0.0000025 lx F1.4 (AGC HIGH=41dB, Shutter=x256, $\gamma=0.35$ , NR=ON)	
S/N		More than 52dB (AGC OFF=6dB, $\gamma=1.0$ , Shutter=x256, NR=ON)	
Function settings		OSD : Jog dial	
AE mode	Fixed	x2, x4, x8, x16, x32, x64, x128, x256 (field)	
		1/60, 1/100 sec.	1/50, 1/120 sec.
		1/250, 1/500, 1/1000, 1/2000, 1/5000, 1/10000, 1/100000 sec.	
EI	1/60 - 1/100000 sec.		
	x256 - 1/100000 sec.		
AGC	ON	6 - 30dB (LOW), 6 - 34.5dB (MID), 6 - 41dB (HIGH)	
	OFF	-	
MGC		6 - 41dB (1dB step)	
Gamma characteristics		$\gamma=0.05 - 1.0$ (0.05 step), USER (S-curve)	
Video level		95IRE	92.5IRE
Noise reduction		3DNR OFF/ON Level adjustable	
Wide dynamic range		D-WDR OFF/ON Level adjustable	
Lens iris		Video/DC (EIA), Auto-select	
Back light compensation		BLC, HSBLC	
White blemish correction		Up to 64 pixels	
Sharpness		Level adjustable	
Defog		-	
Digital zoom		ZOOM (x1 - x32), PAN/TILT	
Privacy mask		-	
Mirror image		OFF, V-FLIP, H-FLIP, HV-FLIP	
Freeze		OFF/ON	
Motion detection		OFF/ON 4areas arbitrarily configurable	
Neg.image		OFF/ON	
Interface		BNC (Composite Video), Power in, Auto iris, 3P connector (GPIO)	
Power supply		DC+12V $\pm$ 10%	
Power consumption		1.38W (115mA)	
Operating temperature		-10 - +50 $^{\circ}$ C	
Storage temperature		-30 - +70 $^{\circ}$ C	
Operating / Storage humidity		95% RH or less (Without condensation)	
Lens mount		CS mount (Back focus adjustable)	
Weight		Approx. 83g	
Accessories		WPDC12 (DC plug), AIC-G (Iris plug), Hex, wrench, I/O cable	

### Specifications

Video standard		EIA	CCIR
Pick-up element		1/2 inch interline transfer CCD image sensor	
Number of effective pixels		768(H) x 494(V)	752(H) x 582(V)
Unit cell size		8.4 $\mu$ m(H) x 9.8 $\mu$ m(V)	8.6 $\mu$ m(H) x 8.3 $\mu$ m(V)
Synchronizing system		Internal	
Scanning system		2:1 interlace	
Video output		Composite video, 1.0 V(p-p) 75 $\Omega$ (Unbalanced)	
Resolution (H)		More than 570TVL (Center)	
Minimum illumination		0.0000025 lx F1.4 (AGC HIGH=41dB, Shutter=x256, $\gamma=0.35$ , NR=ON)	
S/N		More than 52dB (AGC OFF=6dB, $\gamma=1.0$ , Shutter=x256, NR=ON)	
Function settings		OSD : Remote controller	
AE mode	Fixed	x2, x4, x8, x16, x32, x64, x128, x256 (field)	
		1/60, 1/100 sec.	1/50, 1/120 sec.
		1/250, 1/500, 1/1000, 1/2000, 1/5000, 1/10000, 1/100000 sec.	
EI	1/60 - 1/100000 sec.		
	x256 - 1/100000 sec.		
AGC	ON	6 - 30dB (LOW), 6 - 34.5dB (MID), 6 - 41dB (HIGH)	
	OFF	-	
MGC		6 - 41dB (1dB step)	
Gamma characteristics		$\gamma=0.05 - 1.0$ (0.05 step), USER (S-curve)	
Video level		95IRE	92.5IRE
Noise reduction		3DNR OFF/ON Level adjustable	
Wide dynamic range		D-WDR OFF/ON Level adjustable	
Lens iris		Video/DC (EIA), Auto-select	
Back light compensation		BLC, HSBLC	
White blemish correction		Up to 64 pixels	
Sharpness		Level adjustable	
Defog		-	
Digital zoom		ZOOM (x1 - x32), PAN/TILT	
Privacy mask		-	
Mirror image		OFF, V-FLIP, H-FLIP, HV-FLIP	
Freeze		OFF/ON	
Motion detection		OFF/ON 4areas arbitrarily configurable	
Neg.image		OFF/ON	
Interface		BNC (Composite Video), Power in, Auto iris, Remote control (RC-01), 3P connector (GPIO)	
Power supply		DC+12V $\pm$ 10%	
Power consumption		1.38W (115mA)	
Operating temperature		-10 - +50 $^{\circ}$ C	
Storage temperature		-30 - +70 $^{\circ}$ C	
Operating / Storage humidity		95% RH or less (Without condensation)	
Lens mount		CS mount (Back focus adjustable)	
Weight		Approx. 83g	
Accessories		WPDC12 (DC plug), AIC-G (Iris plug), Hex, Wrench, RC-01 (Remote control), I/O cable	

## WAT-902H3 ULTIMATE 1/3" Multi Function & High Sensitivity Camera

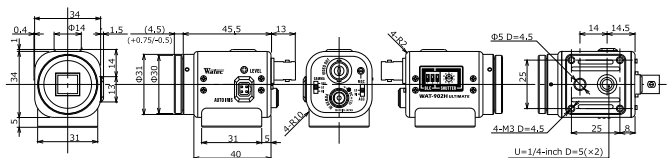
NIR visibility with full camera control



### Key features

- Min. illumination 0.0002 lx. F1.4 by NIR sensitive CCD sensor and our unique image signal amplifying circuit
- High quality image without noise under poor light condition
- Signal amplification level configurable up to 60dB and suitable for moving object in low light condition
- Electric iris, electric shutter, AGC, MGC, BLC and gamma
- Adjustable back focus CS mount
- Stability design housing for installation

### Dimensions



### Specifications

Video standard	CCIR	
Pick-up element	1/3 inch interline transfer CCD image sensor	
Number of effective pixels	752(H) x 582(V)	
Unit cell size	6.5µm(H) x 6.25µm(V)	
Synchronizing system	Internal	
Scanning system	2:1 interface	
Video output	Composite video, 1.0 V(p-p) 75Ω (Unbalanced)	
Resolution (H)	More than 570TVL (Center)	
Minimum illumination	0.0002 lx F1.4 (AGC HIGH=60dB, Shutter=OFF)	
S/N	More than 50dB (AGC OFF=5dB, γ=1.0)	
Function settings	DIP Switch	
AE mode	Fixed	1/50, 1/120 sec.
	EI	1/250, 1/500, 1/1000, 1/2000, 1/5000, 1/10000, 1/100000 sec.
AGC	ON	1/50 - 1/100000 sec., 1/120 - 1/100000 sec.
	OFF	5 - 32dB (LOW), 5 - 60dB (HIGH)
MGC	5 - 60dB	
Gamma characteristics	γ=0.35, 0.45, 1.0	
Video level	100IRE	
Noise reduction	-	
Wide dynamic range	-	
Lens iris	Video / DC (EIA), Auto-select	
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, Auto iris	
Power supply	DC+12V±10%	
Power consumption	1.26W (105mA)	
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. 98g	
Accessories	WPDC12 (DC plug), AIC-G (Iris plug), Hex. wrench	

## WAT-902H2 ULTIMATE 1/2" Multi-function & High Sensitivity Camera

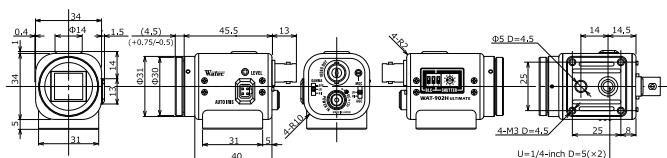
NIR visibility with full camera control



### Key features

- Min. illumination 0.0001 lx. F1.4 by NIR sensitive CCD sensor and our unique image signal amplifying circuit
- High quality image without noise under poor light condition
- Signal amplification level configurable up to 60dB and suitable for moving object in low light condition
- Electric iris, electric shutter, AGC, MGC, BLC and gamma
- Adjustable back focus CS mount
- Stability design housing for installation

### Dimensions



### Specifications

	EIA	CCIR
Video standard	EIA	CCIR
Pick-up element	1/2 inch interline transfer CCD image sensor	
Number of effective pixels	768(H) x 494(V)	752(H) x 582(V)
Unit cell size	8.4µm(H) x 9.8µm(V)	8.6µm(H) x 8.3µm(V)
Synchronizing system	Internal	
Scanning system	2:1 interface	
Video output	Composite video, 1.0 V(p-p) 75Ω (Unbalanced)	
Resolution (H)	More than 570TVL (Center)	
Minimum illumination	0.0001 lx F1.4 (AGC HIGH=60dB, Shutter=OFF)	
S/N	More than 50dB (AGC OFF=5dB, γ=1.0)	
Function settings	DIP Switch	
AE mode	Fixed	1/60, 1/100 sec.
	EI	1/250, 1/500, 1/1000, 1/2000, 1/5000, 1/10000, 1/100000 sec.
AGC	ON	1/60 - 1/100000 sec., 1/100 - 1/100000 sec.
	OFF	1/50 - 1/100000 sec., 1/120 - 1/100000 sec.
MGC	5 - 32dB (LOW), 5 - 60dB (HIGH)	-
Gamma characteristics	γ=0.35, 0.45, 1.0	
Video level	100IRE	
Noise reduction	-	
Wide dynamic range	-	
Lens iris	Video / DC (EIA), Auto-select	
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, Auto iris	
Power supply	DC+12V±10%	
Power consumption	1.32W (110mA)	
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. 98g	
Accessories	WPDC12 (DC plug), AIC-G (Iris plug), Hex. wrench	

## WAT-902H3 SUPREME 1/3" High Sensitivity Camera

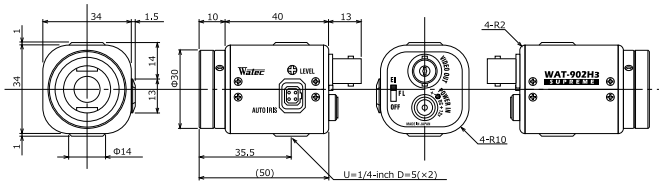
High sensitivity with compact and lightweight body



### Key features

- Min. illumination 0.0005 lx, F1.4 (AGC HIGH=50dB, Shutter=OFF)
- NIR visibility for poor light condition
- Selectable AGC level and shutter speed for demanding scene conditions
- Video drive iris / DC drive iris auto select

### Dimensions



## WAT-902H2 SUPREME 1/2" High Sensitivity Camera

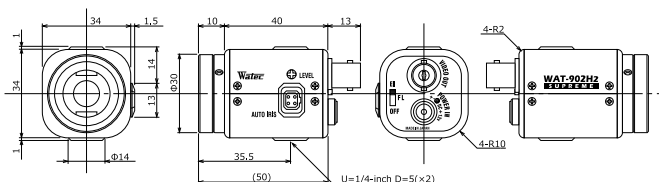
High sensitivity with compact and lightweight body



### Key features

- Min. illumination 0.0003 lx, F1.4 (AGC HIGH=50dB, Shutter=OFF)
- NIR visibility for poor light condition
- Selectable AGC level and shutter speed for demanding scene conditions
- Video drive iris / DC drive iris auto select

### Dimensions



### Specifications

Video standard	CCIR	
Pick-up element	1/3 inch interline transfer CCD image sensor	
Number of effective pixels	752(H) × 582(V)	
Unit cell size	6.5μm(H) × 6.25μm(V)	
Synchronizing system	Internal	
Scanning system	2:1 interlace	
Video output	Composite video, 1.0 V(p-p) 75Ω (Unbalanced)	
Resolution (H)	More than 570TVL (Center)	
Minimum illumination	0.0005 lx F1.4 (AGC HIGH=50dB, Shutter=OFF)	
S/N	More than 46dB (AGC OFF=5dB, γ=1.0)	
Function settings	DIP Switch	
AE mode	Fixed	1/50, 1/120 sec.
	EI	1/50 - 1/100000 sec.
AGC	ON	5 - 32dB (LOW), 5 - 50dB (HIGH)
	OFF	—
MGC	—	
Gamma characteristics	γ=0.45	
Video level	100IRE	
Noise reduction	—	
Wide dynamic range	—	
Lens iris	Video / DC (EIA), Auto-select	
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, Auto iris	
Power supply	DC±12V±10%	
Power consumption	1.86W (155mA)	
Operating temperature	-10 - +40°C	
Storage temperature	-30 - +70°C	
Operating / Storage humidity	95% RH or less (Without condensation)	
Lens mount	CS mount	
Weight	Approx. 90g	
Accessories	WPDC12 (DC plug), AIC-G (Iris plug), Hex. wrench	

### Specifications

	EIA	CCIR
Video standard	EIA	CCIR
Pick-up element	1/2 inch interline transfer CCD image sensor	
Number of effective pixels	768(H) × 494(V)	752(H) × 582(V)
Unit cell size	8.4μm(H) × 9.8μm(V)	8.6μm(H) × 8.3μm(V)
Synchronizing system	Internal	
Scanning system	2:1 interlace	
Video output	Composite video, 1.0 V(p-p) 75Ω (Unbalanced)	
Resolution (H)	More than 570TVL (Center)	
Minimum illumination	0.0003 lx F1.4 (AGC HIGH=50dB, Shutter=OFF)	
S/N	More than 46dB (AGC OFF=5dB, γ=1.0)	
Function settings	DIP Switch	
AE mode	Fixed	1/60, 1/100 sec.
	EI	1/60 - 1/100000 sec.
AGC	ON	5 - 32dB (LOW), 5 - 50dB (HIGH)
	OFF	—
MGC	—	
Gamma characteristics	γ=0.45	
Video level	100IRE	
Noise reduction	—	
Wide dynamic range	—	
Lens iris	Video / DC (EIA), Auto-select	
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, Auto iris	
Power supply	DC±12V±10%	
Power consumption	1.98W (165mA)	
Operating temperature	-10 - +40°C	
Storage temperature	-30 - +70°C	
Operating / Storage humidity	95% RH or less (Without condensation)	
Lens mount	CS mount	
Weight	Approx. 90g	
Accessories	WPDC12 (DC plug), AIC-G (Iris plug), Hex. wrench	

# WAT-902B

1/2" Low Noise · High Sensitivity Camera

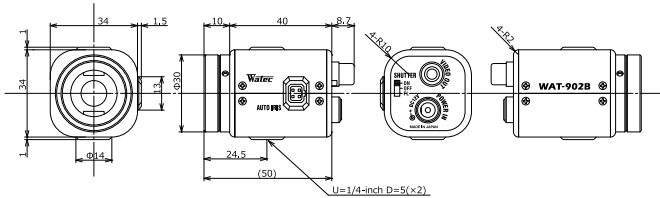
High cost performance model among the WAT-902 series



### Key features

- High sensitivity with low noise operation
- Min. illumination 0.003 lx F1.4 (AGC HIGH=32dB, Shutter=OFF)

### Dimensions

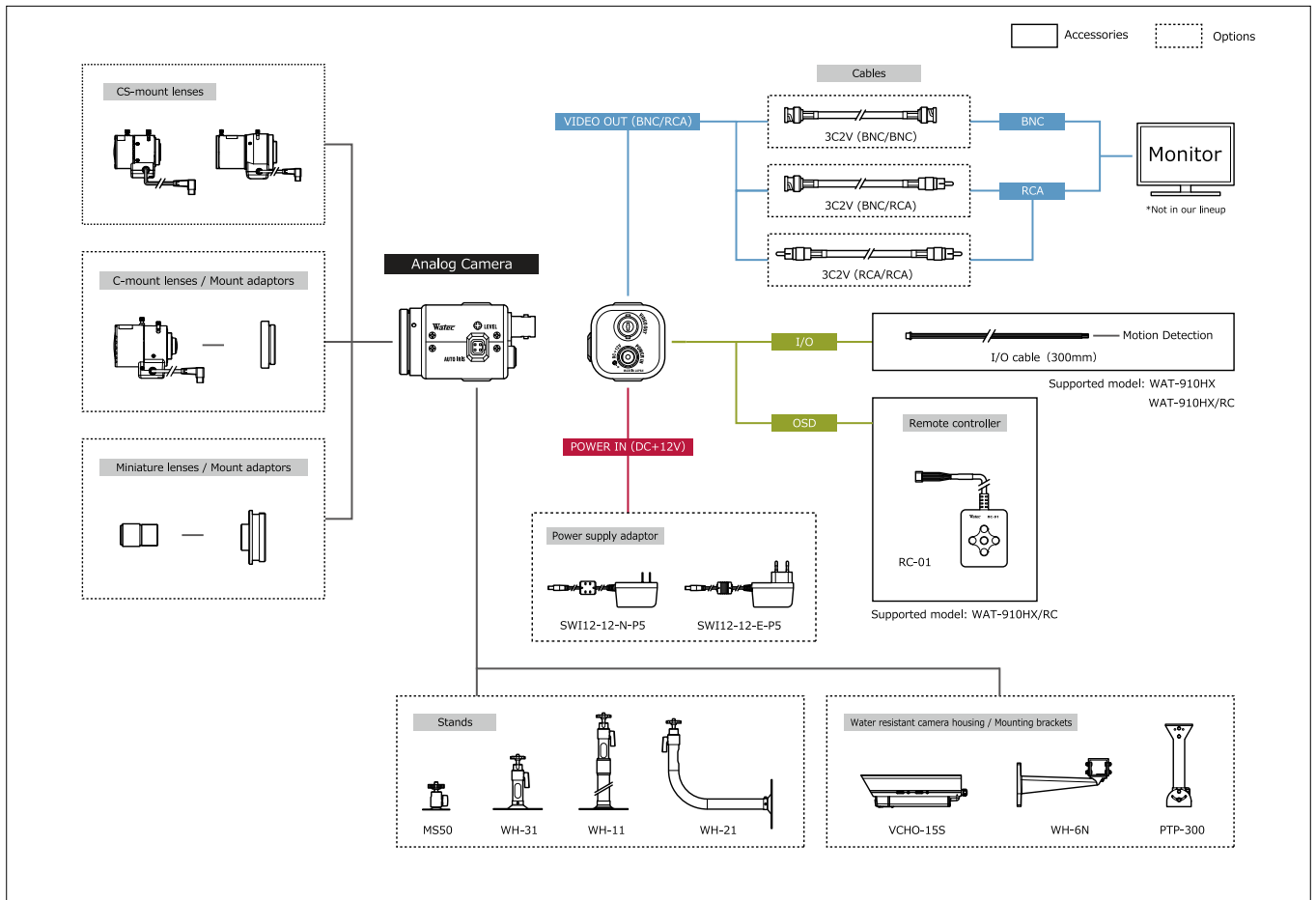


### Specifications

Video standard		EIA	CCIR
Pick-up element		1/2 inch interline transfer CCD image sensor	
Number of effective pixels		768(H) × 494(V)	752(H) × 582(V)
Unit cell size		6,35μm(H) × 7,4μm(V)	8,6μm(H) × 8,3μm(V)
Synchronizing system		Internal	
Scanning system		2:1 interface	
Video output		Composite video, 1.0 V(p-p) 75Ω (Unbalanced)	
Resolution (H)		More than 570TVL (Center)	
Minimum illumination		0.003 lx F1.4 (AGC HIGH=32dB, Shutter=OFF)	
S/N		More than 50dB (AGC OFF=10dB, γ=1.0)	
Function settings		DIP Switch	
AE mode	Fixed	1/60, 1/100 sec.	1/50, 1/120 sec.
	EI	1/60 - 1/100000 sec.	1/50 - 1/100000 sec.
AGC	ON	5 - 20dB (LOW), 5 - 32dB (HIGH)	
	OFF	10dB	
MGC		-	
Gamma characteristics		γ=0.45, 1.0	
Video level		100IRE	
Noise reduction		-	
Wide dynamic range		-	
Lens iris		Video (Watec original arrangement)	
Back light compensation		BLC	
White blemish correction		-	
Sharpness		-	
Defog		-	
Digital zoom		-	
Privacy mask		-	
Mirror image		-	
Freeze		-	
Motion detection		-	
Neg. image		-	
Interface		RCA (Composite Video), Power in, Auto iris	
Power supply		DC+12V±10%	
Power consumption		1.74W (145mA)	
Operating temperature		-10 - +40°C	
Storage temperature		-30 - +70°C	
Operating / Storage humidity		95% RH or less (Without condensation)	
Lens mount		CS mount	
Weight		Approx. 86g	
Accessories		WPDC12 (DC plug), AIC (Iris plug)	

### System diagram

Representative connection example of the analog cameras



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

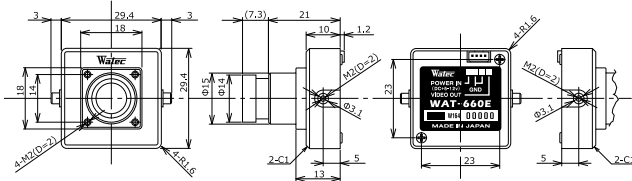
Compact square camera with built-in lens



### 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

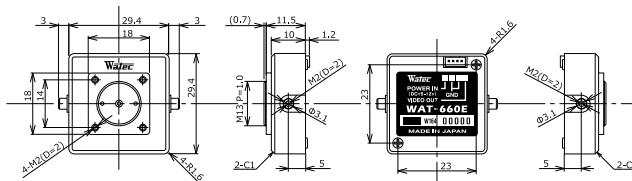
Compact square camera with built-in lens



### 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	

### WAT-910HX MBD (G3.6) 1/3" Super High Sensitivity Miniature Board Camera

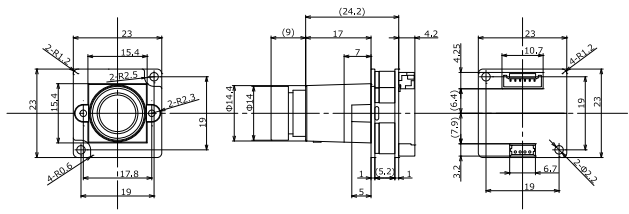
Ultra-compact design only 23 x 23mm for limited space and embedded application



#### Key features

- Min. illumination 0.00009 lx F2.0 (AGC ON=48dB, Shutter=x8)
  - Advanced setting available by OSD (On Screen Display) through an optional remote control
  - Build-in M12 lens G3.6 (f=3.6mm F2.0), Various Optional M12 lenses available
- \*Glass lenses and pinhole lenses are not interchangeable

#### Dimensions



### WAT-910HX MBD (P3.3) 1/3" Super High Sensitivity Miniature Board Camera

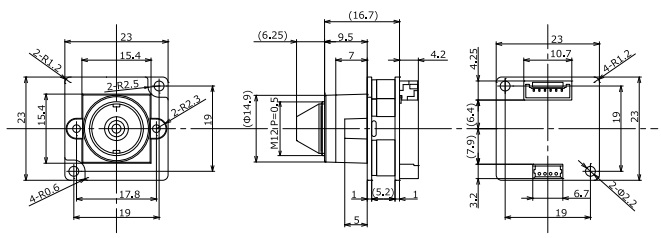
Ultra-compact design only 23 x 23mm for limited space and embedded application



#### Key features

- Advanced setting available by OSD (On Screen Display) through an optional remote control
  - Build-in M12 Conical Pinhole lens P3.3 (f=3.3mm F2.4)
- \*Glass lenses and pinhole lenses are not interchangeable

#### Dimensions



#### Specifications

Video standard	CCIR	
Pick-up element	1/3 inch interline transfer CCD image sensor	
Number of effective pixels	752(H) × 582(V)	
Unit cell size	6.5µm(H) × 6.3µm(V)	
Synchronizing system	Internal	
Scanning system	2:1 interlace	
Video output	Composite video, 1.0 V(p-p) 75Ω (Unbalanced)	
Resolution (H)	More than 570TVL (Center)	
Minimum illumination	0.00009 lx F2.0 (AGC ON=48dB, Shutter=x8)	
S/N	More than 50dB (AGC OFF=6dB, γ=0.45, Shutter=OFF, NR=ON)	
Function settings	OSD : Remote controller	
AE mode	Fixed	x2, x4, x8, x16, x32, x64, x128, x256 (field)
		1/50, 1/100 sec.
	EI	1/250, 1/500, 1/1000, 1/2000, 1/4000, 1/10000 sec.
AGC	ON	1/50 - 1/100000 sec.
		x8 - 1/100000 sec.
	OFF	0 - 48dB (Max. 6 - 48)
MGC	6 - 48dB (6dB step)	
Gamma characteristics	γ=0.45	
Video level	Adjustable	
Noise reduction	3D+2DNR ON Level adjustable	
Wide dynamic range	D-WDR OFF/ON Level adjustable	
Lens iris	-	
Back light compensation	BLC, HSBLC	
White blemish correction	Up to 64 pixels	
Sharpness	Level adjustable	
Defog	OFF/ON Level adjustable	
Digital zoom	ZOOM (x1 - x256), PAN/TILT	
Privacy mask	15 masks	
Mirror image	OFF, V-FLIP, H-FLIP, HV-FLIP	
Freeze	-	
Motion detection	OFF/ON Select from 96 detection areas	
Neg.image	-	
Interface	4P connector (Composite Video, Power in), Remote control (RC-01)	
Power supply	DC+5V - 12V	
Power consumption	0.75W/150mA (DC+5V), 0.78W/65mA (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	M3620C-12 (f3.6 F2.0)	
Weight	Approx. 14g	
Accessories	4P cable	

#### Specifications

Video standard	CCIR	
Pick-up element	1/3 inch interline transfer CCD image sensor	
Number of effective pixels	752(H) × 582(V)	
Unit cell size	6.5µm(H) × 6.3µm(V)	
Synchronizing system	Internal	
Scanning system	2:1 interlace	
Video output	Composite video, 1.0 V(p-p) 75Ω (Unbalanced)	
Resolution (H)	More than 570TVL (Center)	
Minimum illumination	0.00016 lx F2.4 (AGC ON=48dB, Shutter=x8)	
S/N	More than 50dB (AGC OFF=6dB, γ=0.45, Shutter=OFF, NR=ON)	
Function settings	OSD : Remote controller	
AE mode	Fixed	x2, x4, x8, x16, x32, x64, x128, x256 (field)
		1/50, 1/100 sec.
	EI	1/250, 1/500, 1/1000, 1/2000, 1/4000, 1/10000 sec.
AGC	ON	1/50 - 1/100000 sec.
		x8 - 1/100000 sec.
	OFF	0 - 48dB (Max. 6 - 48)
MGC	6 - 48dB (6dB step)	
Gamma characteristics	γ=0.45	
Video level	Adjustable	
Noise reduction	3D+2DNR ON Level adjustable	
Wide dynamic range	D-WDR OFF/ON Level adjustable	
Lens iris	-	
Back light compensation	BLC, HSBLC	
White blemish correction	Up to 64 pixels	
Sharpness	Level adjustable	
Defog	OFF/ON Level adjustable	
Digital zoom	ZOOM (x1 - x256), PAN/TILT	
Privacy mask	15 masks	
Mirror image	OFF, V-FLIP, H-FLIP, HV-FLIP	
Freeze	-	
Motion detection	OFF/ON Select from 96 detection areas	
Neg.image	-	
Interface	4P connector (Composite Video, Power in), Remote control (RC-01)	
Power supply	DC+5V - 12V	
Power consumption	0.75W/150mA (DC+5V), 0.78W/65mA (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	3324B-12P(A) (f3.3 F2.4)	
Weight	Approx. 10g	
Accessories	4P cable	



# WAT-902HB3S

1/3" High Sensitivity Board Camera

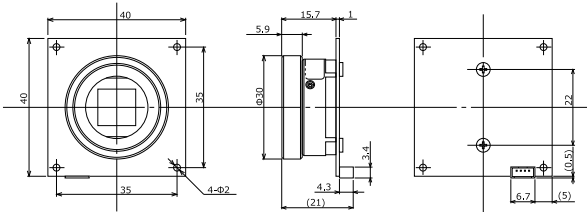
NIR sensitivity with multi-function



### Key features

- Equality performance on NIR sensitivity and features to WAT-902H series
- Selectable camera settings for demanding scene conditions
- Electric iris, electric shutter, AGC, BLC and gamma switching

### Dimensions



### Specifications

Video standard	CCIR	
Pick-up element	1/3 inch interline transfer CCD image sensor	
Number of effective pixels	752(H) × 582(V)	
Unit cell size	6.5μm(H) × 6.25μm(V)	
Synchronizing system	Internal	
Scanning system	2:1 interlace	
Video output	Composite video, 1.0 V(p-p) 75Ω (Unbalanced)	
Resolution (H)	More than 570TVL (Center)	
Minimum illumination	0.0006 lx F1.4 (AGC HIGH=50dB, Shutter=OFF)	
S/N	More than 50dB (AGC OFF=5dB, γ=1.0)	
Function settings	DIP Switch	
AE mode	Fixed	1/50, 1/120 sec.
	EI	1/250, 1/500, 1/1000, 1/2000, 1/5000, 1/10000, 1/100000 sec.
AGC	ON	1/50 - 1/100000 sec.
	OFF	5 - 32dB (LOW), 5 - 50dB (HIGH)
MGC	-	
Gamma characteristics	γ=0.45, 1.0	
Video level	100IRE	
Noise reduction	-	
Wide dynamic range	-	
Lens iris	Video	
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+12V±10%	
Power consumption	1.92W (160mA)	
Operating temperature	-10 - +40°C	
Storage temperature	-30 - +70°C	
Operating / Storage humidity	95% RH or less (Without condensation)	
Lens mount	CS mount	
Weight	Approx. 30g	
Accessories	4P cable, Hex. wrench	

# WAT-902HB2S

1/2" High Sensitivity Board Camera

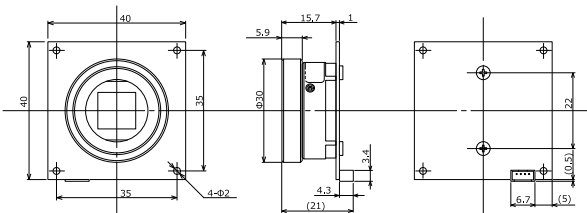
NIR sensitivity with multi-function



### Key features

- Equality performance on NIR sensitivity and features to WAT-902H series
- Selectable camera settings for demanding scene conditions
- Electric iris, electric shutter, AGC, BLC and gamma switching

### Dimensions



### Specifications

	EIA	CCIR
Video standard	EIA	CCIR
Pick-up element	1/2 inch interline transfer CCD image sensor	
Number of effective pixels	768(H) × 494(V)	752(H) × 582(V)
Unit cell size	8.4μm(H) × 9.8μm(V)	8.6μm(H) × 8.3μm(V)
Synchronizing system	Internal	
Scanning system	2:1 interlace	
Video output	Composite video, 1.0 V(p-p) 75Ω (Unbalanced)	
Resolution (H)	More than 570TVL (Center)	
Minimum illumination	0.0003 lx F1.4 (AGC HIGH=50dB, Shutter=OFF)	
S/N	More than 50dB (AGC OFF=5dB, γ=1.0)	
Function settings	DIP Switch	
AE mode	Fixed	1/60, 1/100 sec.
	EI	1/50, 1/120 sec.
AGC	ON	1/250, 1/500, 1/1000, 1/2000, 1/5000, 1/10000, 1/100000 sec.
	OFF	1/60 - 1/100000 sec.
MGC	5 - 32dB (LOW), 5 - 50dB (HIGH)	
Gamma characteristics	γ=0.45, 1.0	
Video level	100IRE	
Noise reduction	-	
Wide dynamic range	-	
Lens iris	Video	
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+12V±10%	
Power consumption	1.92W (160mA)	
Operating temperature	-10 - +40°C	
Storage temperature	-30 - +70°C	
Operating / Storage humidity	95% RH or less (Without condensation)	
Lens mount	CS mount	
Weight	Approx. 30g	
Accessories	4P cable, Hex. wrench	

# WAT-910BD 1/2" NIR Sensitivity Board Camera

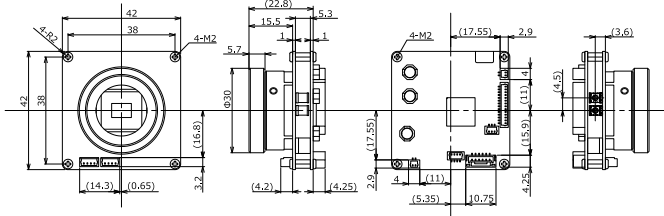
Achieves minimum illumination performance by 1/2-inch high sensitive CCD sensor and unique circuit design



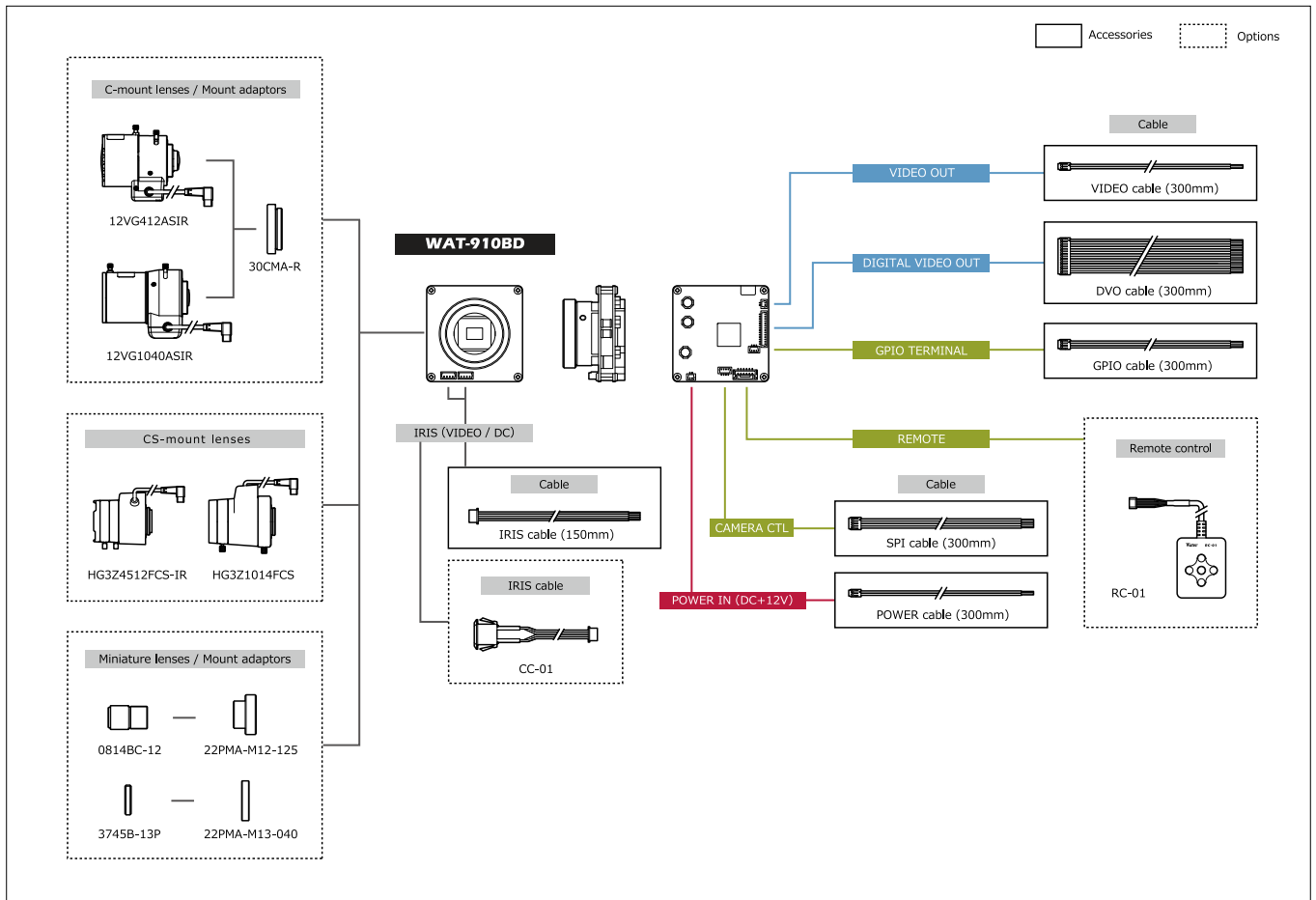
### Key features

- Min. illumination 0.0000025 lx F1.4 (AGC HIGH=41dB, Shutter=x256, γ=0.35, NR=ON)
- High quality image without noise under poor light condition
- 3DNR, digital wide dynamic range and slow shutter
- Motion detection, white blemish correction and back light compensation
- Advanced setting available by OSD (On Screen Display) through an optional remote control and SPI communication

### Dimensions



### System diagram



### Specifications

		EIA	CCIR
Video standard		EIA	CCIR
Pick-up element		1/2 inch interline transfer CCD image sensor	
Number of effective pixels		768(H) × 494(V)	752(H) × 582(V)
Unit cell size		8.4μm(H) × 9.8μm(V)	8.6μm(H) × 8.3μm(V)
Synchronizing system		Internal	
Scanning system		2:1 interface	
Video output		Composite video, 1.0 V(p-p) 75Ω (Unbalanced)	
Resolution (H)		More than 570TVL (Center)	
Minimum illumination		0.0000025 lx F1.4 (AGC HIGH=41dB, Shutter=x256, γ=0.35, NR=ON)	
S/N		More than 52dB (AGC OFF=6dB, γ=1.0, Shutter=x256, NR=ON)	
Function settings		OSD : Remote controller, Communication : SPI	
AE mode	Fixed	1/60, 1/100 sec.	1/50, 1/120 sec.
		1/250, 1/500, 1/1000, 1/2000, 1/5000, 1/10000, 1/100000 sec.	
	EI	1/60 - 1/100000 sec.	1/50 - 1/100000 sec.
AGC	ON	6 - 30dB (LOW), 6 - 34.5dB (MID), 6 - 41dB (HIGH)	
	OFF	-	
MGC		6 - 41dB (1dB step)	
Gamma characteristics		γ=0.05 - 1.0 (0.05 step), USER (S-curve)	
Video level		95IRE	92.5IRE
Noise reduction		3DNR OFF/ON Level adjustable	
Wide dynamic range		D-WDR OFF/ON Level adjustable	
Lens iris		Video/DC (EIA), Auto-select	
Back light compensation		BLC, HSBC	
White blemish correction		Up to 64 pixels	
Sharpness		Level adjustable	
Defog		-	
Digital zoom		ZOOM (x1 - x32), PAN/TILT	
Privacy mask		-	
Mirror image		OFF, V-FLIP, H-FLIP, HV-FLIP	
Freeze		OFF/ON	
Motion detection		OFF/ON 4areas arbitrarily configurable	
Neg.image		OFF/ON	
Interface		14P connector (Digital video out), 2P connector (Composite Video), 2P connector (Power in), 4P connector (DC iris), 4P connector (Video iris), Remote control (RC-01), 4P connector (SPI), 3P connector (GPIO)	
Power supply		DC+12V±10%	
Power consumption		1.32W (110mA)	
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. 40g	
Accessories		Hex. Wrench, Cable (6 pcs)	

DC Auto Iris Lenses (MP)



Model	M13VG288IR		M13VG850IR	
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 - 360		8.0 - 50 mm / F1.6 - 360	
Angle of view (HxV)	1/2.7"	W: 124.3° × 65.2° / T: 43.0° × 24.2°	W: 40.2° × 22.6° / T: 6.6° × 3.8°	
	1/3"	W: 100.1° × 72.9° / T: 35.8° × 26.8°	W: 33.5° × 25.1° / T: 5.6° × 4.2°	



Model	AG3Z2812FCS-MPWIR		AG4Z1214FCS-MPIR	
Imager size	1/2.7", 1/3"		1/2.7", 1/3"	
Mount type	CS		CS	
Focal length / Aperture range	2.8 - 8.5 mm / F1.2 - 360		12.5 - 50 mm / F1.4 - 360	
Angle of view (HxV)	1/2.7"	W: 124.7° × 63.9° / T: 41.3° × 22.7°	W: 26.3° × 14.5° / T: 6.7° × 3.8°	
	1/3"	W: 99.1° × 72.3° / T: 34.1° × 25.6°	W: 21.7° × 16.2° / T: 5.6° × 4.3°	



Model	AG4Z2812FCS-MPIR		EG3Z3915FCS-MPWIR	
Imager size	1/2.7", 1/3"		1/1.8", 1/2"	
Mount type	CS		CS	
Focal length / Aperture range	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: 127.6° × 65.0° / T: 34.3° × 18.9°	-	
	1/2"	-	W: 96.0° × 70.2° / T: 37.9° × 28.4°	
	1/3"	W: 101.3° × 73.7° / T: 28.4° × 21.3°	-	

Manual Iris Lenses (MP)



Model	M13VM288IR		A4Z2812CS-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°	

DC Auto Iris Lenses



Model	12VG412ASIR		12VG1040ASIR	
Imager size	1/2" , 1/3"		1/2" , 1/3"	
Mount type	C		C	
Focal length / Aperture range	4.0 - 12 mm / F1.2 - 360		10 - 40 mm / F1.4 - 360	
Angle of view (HxV)	1/2"	W: 97.3° × 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°	



Model	13VG308ASIR II		13VG1040ASIR	
Imager size	1/3" , 1/4"		1/3" , 1/4"	
Mount type	CS		CS	
Focal length / Aperture range	3.0 - 8.0 mm / F1.0 - 360		10 - 40 mm / F1.4 - 360	
Angle of view (HxV)	1/3"	W: 92.5° × 68.0° / T: 35.7° × 26.8°	W: 37.5° × 27.6° / T: 9.3° × 7.0°	
	1/4"	W: 68.0° × 50.4° / T: 26.8° × 20.1°	W: 27.6° × 20.4° / T: 7.0° × 5.3°	



Model	TG4Z2813FCS-IR-2	
Imager size	1/3" , 1/4"	
Mount type	CS	
Focal length / Aperture range	2.8 - 12 mm / F1.3 - 360	
Angle of view (HxV)	1/3"	W: 102.2° × 74.2° / T: 23.7° × 17.8°
	1/4"	W: 74.2° × 54.7° / T: 17.8° × 13.3°

Manual Iris Lenses



Model	13VM308ASIR II		T4Z2813CS-IR-2	
Imager size	1/3" , 1/4"		1/3" , 1/4"	
Mount type	CS		CS	
Focal length / Aperture range	3.0 - 8.0 mm / F1.0 - Close		2.8 - 12 mm / F1.3 - Close	
Angle of view (HxV)	1/3"	W: 92.5° × 68.0° / T: 35.7° × 26.8°	W: 102.2° × 74.2° / T: 23.7° × 17.8°	
	1/4"	W: 68.0° × 50.4° / T: 26.8° × 20.1°	W: 74.2° × 54.7° / T: 17.8° × 13.3°	

Miniature Lenses (MP)



Model		M2520BC-12	M2920BC-12	M3620BC-12
Focal length / Aperture range		2.5 mm / F2.0	2.9 mm / F2.0	3.6 mm / F2.0
Angle of view (D×H×V)	1/2.8"	154.6° × 131.3° × 70.7°	134.9° × 115.3° × 62.8°	110.0° × 92.0° × 49.0°
	1/3"	143.2° × 111.1° × 81.7°	125.4° × 98.2° × 72.5°	102.0° × 77.0° × 56.0°
	1/3.2"	132.2° × 103.2° × 76.1°	116.2° × 91.2° × 67.6°	93.0° × 72.0° × 52.0°
	1/4"	103.6° × 87.7° × 60.7°	92.0° × 72.8° × 54.2°	73.0° × 57.0° × 42.0°
Mount		M12 P=0.5mm	M12 P=0.5mm	M12 P=0.5mm



Model		M0620BC-12	M0816BC-12	M1616BC-12
Focal length / Aperture range		6.0 mm / F2.0	8.0 mm / F1.6	16 mm / F1.6
Angle of view (D×H×V)	1/2.8"	62.0° × 53.8° × 30.0°	44.0° × 38.0° × 22.0°	22.0° × 19.0° × 11.0°
	1/3"	58.2° × 46.3° × 34.6°	41.0° × 33.0° × 25.0°	20.0° × 17.0° × 13.0°
	1/3.2"	54.2° × 43.1° × 32.3°	-	20.0° × 16.1° × 12.2°
	1/4"	43.3° × 34.6° × 25.9°	-	15.9° × 13.0° × 9.8°
Mount		M12 P=0.5mm	M12 P=0.5mm	M12 P=0.5mm

Miniature Lenses



Model		2520BC-12	2920BC-12	3820BC-12	0625BC-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
Angle of view (D×H×V)	1/2"	-	-	-	-
	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°
	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



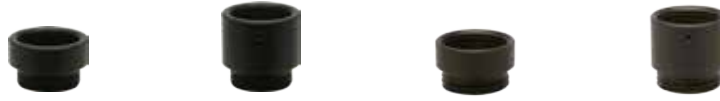
Model		0814BC-12	0820BC-12	1220BC-12	2540EX014-M12
Focal length / Aperture range		8.0 mm / F1.4	8.0 mm / F2.0	12 mm / F2.0	25 mm / F4.0
Angle of view (D×H×V)	1/2"	54.6° × 44.4° × 33.7°	-	-	17.9° × 14.4° × 10.8°
	1/3"	41.8° × 33.7° × 25.5°	44.5° × 34.6° × 25.5°	28.5° × 22.8° × 17.2°	13.5° × 10.8° × 8.1°
	1/4"	-	32.3° × 25.5° × 18.9°	21.4° × 17.2° × 12.9°	10.1° × 8.1° × 6.1°
Mount		M12 P=0.5mm	M12 P=0.5mm	M12 P=0.5mm	M12 P=0.5mm



Model		3720B-12P(B)	3745B-13P
Focal length / Aperture range		3.7 mm / F2.0	3.7 mm / F4.5
Angle of view (D×H×V)	1/2"	-	-
	1/3"	90.0° × 57.8° × 48.6°	91.4° × 72.6° × 54.2°
	1/4"	63.5° × 48.6° × 35.7°	68.0° × 54.2° × 40.6°
Mount		M12 P=0.5mm	M13 P=1.0mm

## Extenders

Lens mounts to be attached between a lens and a camera to extends the focal length



Model	EX005-M12-2	EX010-M12-2	EX005-M13	EX010-M13
Material / Surface finishing	Aluminum / Black alumite (Pearskin finish)		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

## C-mount Adaptors

CS to C-mount adaptors allow which CS-mount CCTV cameras to be used with C-mount lenses



Model	30CMA-R	34CMA-R
Material / Surface finishing	Aluminum / Black alumite (Pearskin finish)	
Mount	U1-32UN	
Dimensions	Φ30 × 9 mm	Φ34 × 9 mm

## Mount Adaptors

Lens mounts to make miniature lenses applicable to CS-mount cameras



Model	28MMA-M12-090	28MMA-M12-140	28MMA-M12-155
Material / Surface finishing	Aluminum / Black alumite (Pearskin finish)		
Mount	M12 P=0.5		
Dimensions	Φ31 × 9 mm	Φ31 × 14 mm	Φ31 × 15.5 mm

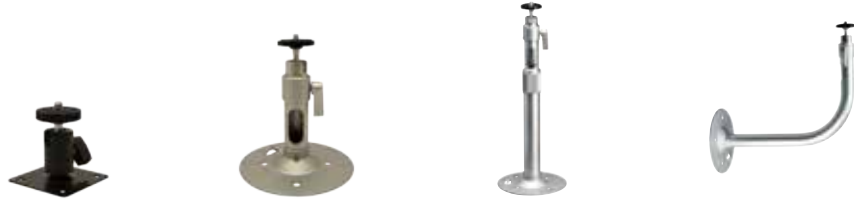


Model	22PMA-M12-125	22PMA-M13-040
Material / Surface finishing	Aluminum / Black alumite (Pearskin finish)	
Mount	M12 P=0.5	M13 P=1.0
Dimensions	Φ21.9 × 12.5 mm	Φ21.9 × 4 mm



Model	29PMA-M12-125	30.5MMA-M12-120
Material / Surface finishing	Aluminum / Black alumite (Pearskin finish)	
Mount	M12 P=0.5	
Dimensions	Φ28.9 × 12.5 mm	Φ36 × 12 mm

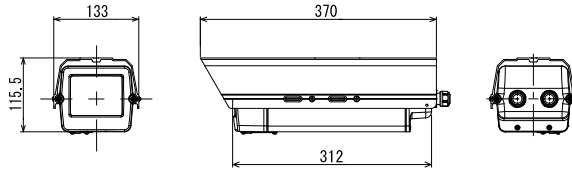
## Stands



Model	MS50	WH-31	WH-11	WH-21
Operating locaton	Ceiling (Indoor)	Ceiling (Indoor)	Ceiling (Two stage stretch, Indoor)	Wall/Ceiling (L type, Indoor)
Capability	-	Max. 2kg	Max. 2kg	Max. 2kg
Main materials	Steel SPCC and Aluminium			
Color	Black	Silver	Silver	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-15S
Installation condition	Indoor / Outdoor
Main material	Aluminium (ADC-12, A6063)
Color	Ivory
Inside dimension	95(W) × 70(H) × 210(L) mm
Weight	Approx. 2.4kg
Waterproof performance	IEC standard IPX5

### Mounting bracket for VCHO-15S



Model	WH-6N	PTP-300
Operating locaton	Wall (Indoor / Outdoor)	Ceiling (Indoor / Outdoor)
Capability	15Kg	10Kg
Main materials	Aluminium (ADC-12, A6063)	Aluminium (ADC-12, A6063)
Color	Ivory	Ivory
Dimensions	337(L) × 115(W) × 176(H) mm	100(L) × 100(W) × 300(H) mm
Weight	1.4kg	0.9kg

### Housings for the MBD cameras



Model	CH-01	CH-02
Supported models	WAT-910HX MBD (G3.6)	WAT-1100MBD (G3.6)
Supported lenses	2520BC-12, 2920BC-12, M3620BC-12, 0625BC-12, 0816BC-12, 1220BC-12, M1616BC-12, 2540EX014-M12	M2520BC-12, M2920BC-12, M3620BC-12, M0620BC-12, M0816BC-12, M1616BC-12
Main materials	Aluminium	Aluminium
Weight	Approx. 25g (M3620BC-12)	Approx. 23.5g (M3620BC-12)

## Holders



Model	H002	H003
Materials	Brass / ABS resin	Brass
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-01U2, WAT-03U2



Model	TS01A
Materials	SUS304 / POM resin
Description	Holder for attaching the WAT-03U2D, WAT-02U2D to the side such as a helmet

## Brackets



Model	B001	B004	B005
Materials	Brass / ABS resin	Brass / ABS resin	ABS resin
Supported models	WAT-30HD, WAT-230V2, WAT-660E	WAT-2200 Mk-2	WAT-03U2, WAT-01U2, WAT-1200CS
Description	Brackets for fixing the cameras on a stands or tripods		



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

## Conversion Connectors

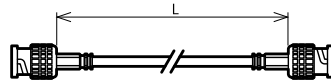


3G/HD-SDI supported

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)

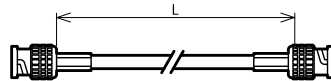


3G/HD-SDI supported

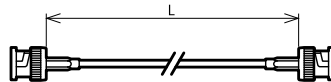


Model	Length(=L)m	Cable	Connector
2.5CHD(BNC/BNC)-2.5M	2.5	75Ω coaxial cable L-2.5CHD (Black) *Cable for fixed wiring	75Ω BNC plug (Crimp type)
2.5CHD(BNC/BNC)-3M	3		
2.5CHD(BNC/BNC)-5M	5		
2.5CHD(BNC/BNC)-10M	10		

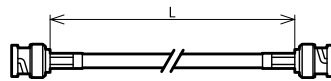
3G/HD-SDI supported



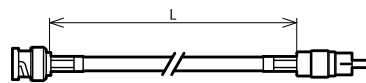
Model	Length(=L)m	Cable	Connector
3CFW(BNC/BNC)-2.5M	2.5	75Ω coaxial cable L-3CFW (Black) *Cable for portable wiring	75Ω BNC plug (Crimp type)
3CFW(BNC/BNC)-3M	3		
3CFW(BNC/BNC)-5M	5		
3CFW(BNC/BNC)-10M	10		



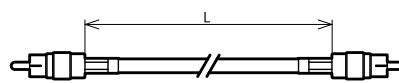
Model	Length(=L)m	Cable	Connector
1.5C2V(BNC/BNC)-1M	1	75Ω coaxial cable 1.5C-2V (Black)	75Ω BNC plug (Crimp type)



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

Network

SDI

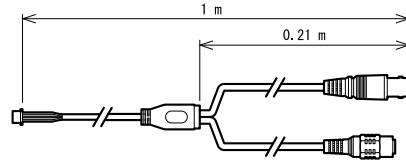
USB

Analog Color

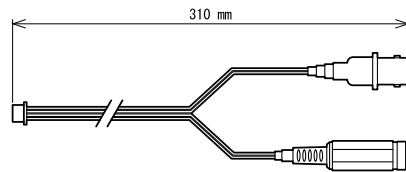
Analog Monochrome

Options

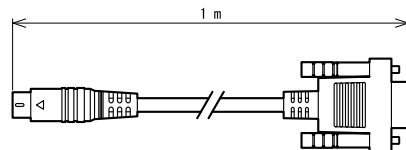
Other



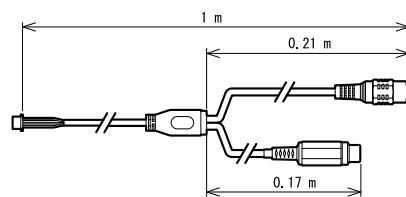
Model	Supported models	Connector
CB-01	WAT-1200CS, WAT-230V2, WAT-1100MBD, WAT-660E, WAT-910HX MBD	VIDEO OUT (BNC), POWER IN (DC Jack)



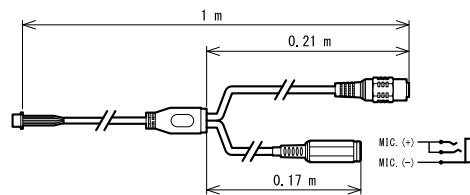
Model	Supported models	Connector
CB-02	WAT-902HB, W-03CDB3, W-04CDB3	VIDEO OUT (BNC), POWER IN (DC Jack)



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



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



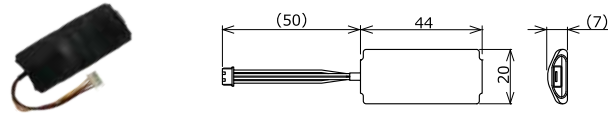
Model	Supported models	Description	Connector
CB-07	WAT-2400S, WAT-933	Utilize when connecting the mic which is plug-in power type.	POWER IN (DC Jack), MIC. IN (3-Conductor miniature jack)

## Iris Cables



Model	CC-01	CC-02
Description	Auto iris cable w/ connectors (WAT-910BD)	Auto iris cable w/ connectors (W-03CDB3)

## Remote Controllers



Model	AVM-USB2
Description	Equipment for the functional settings of the WAT-240E/FS
Supported models	WAT-240E/FS
Cable length	Approx. 50mm



Model	RC-01	RC-02
Description	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 (m)	Approx. 1.5	
Dimensions	50(H) × 40.5(W) × 12(D) mm (Excluding cable)	

## Power Supply Adaptors



Model	SWI6-5.9-N-P13	SWI6-5.9-E-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 C	Type A	Type C
Connector	EIAJ2 (Φ4.0 × Φ1.7)		Φ5.5 × Φ2.1	
Weight	Approx. 78g	Approx. 96g	Approx. 126g	Approx. 126g

## HD-SDI Converter

Model	VPC-SH3STD
Supported resolution	SD-SDI : 720×480i/59.94, 720×576i/50, HD-SDI : 1280×720p/59.94/p60/p50, 1920×1080i/59.94/i60/i50, 1920×1080p/23.98/p24/p25/p29.97/p30, 3G-SDI Level A : 1920×1080p/59.94/p60/p50 3G-SDI Level B-DL : 1920×1080p/59.94/p60/p50 *Not supported 3G-SDI Level B-DS
Input / Output terminal	SDI (75ΩBNC) × 1 / HDMI type A × 1, SDI (75ΩBNC) × 1
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 supply	AC adaptor: AC+100 - 240V, DC+12V 160mA USB bus power: +5V 330mA
Max. power consumption	AC 2.27W
Operating / Storage temperature	0 - 50°C (without condensing) / -20 - +60°C



## ■ Optional Lenses Correspondence Table

	Camera	Lens type	Mount adaptor	Compatible lens
Network	WAT-2400S WAT-933	CCTV	-	M13VG288IR, M13VG850IR, AG3Z2812FCS-MPWIR, AG4Z1214FCS-MPIR
		MINI	28MMA-M12-155	M2520BC-12, M2920BC-12, M3620BC-12, M0620BC-12, M0816BC-12
	28MMA-M12-140		M1616BC-12	
	WAT-2400	CCTV	-	M13VG288IR, M13VG850IR, AG3Z2812FCS-MPWIR, AG4Z1214FCS-MPIR
		MINI	28MMA-M12-140	M2520BC-12, M2920BC-12, M3620BC-12, M0620BC-12, M0816BC-12
	28MMA-M12-090		M1616BC-12	
SDI	WAT-2200 Mk-2	CCTV	-	M13VG288IR, M13VG850IR, AG3Z2812FCS-MPWIR, AG4Z1214FCS-MPIR
		MINI	29PMA-M12-125	M2520BC-12, M2920BC-12, M3620BC-12, M0620BC-12, M0816BC-12
	WAT-30HD(G3.6)	MINI	-	M2520BC-12, M2920BC-12, M3620BC-12, M0620BC-12, M0816BC-12
WAT-30HD/CS	CCTV	-	M13VM288IR	
USB	WAT-03U2 WAT-01U2	CCTV	-	M13VM288IR, A4Z2812CS-MPIR
		MINI	28MMA-M12-155	M2520BC-12, M2920BC-12, M3620BC-12, M0620BC-12, M0816BC-12
	28MMA-M12-140		M1616BC-12	
WAT-03U2D WAT-02U2D	MINI	-	M3620BC-12, M0620BC-12, M0816BC-12	
Analog Color	WAT-1200CS	CCTV	-	M13VG288IR, M13VG850IR, AG3Z2812FCS-MPWIR, AG4Z1214FCS-MPIR
	WAT-233	CCTV	-	M13VG288IR, M13VG850IR
	WAT-221S2	CCTV	34CMA-R	12VG412ASIR, 12VG1040ASIR
		MINI	29PMA-M12-125	0814BC-12
	WAT-231S2	CCTV	-	13VG308ASIR II, 13VG1040ASIR, TG4Z2813FCS-IR-2
		MINI	30.5MMA-M12-120	2520BC-12, 2920BC-12, 3820BC-12, 0625BC-12, 0814BC-12, 0820BC-12, 1220BC-12, M1616BC-12, 2540EX014-M12
	WAT-250D2	CCTV	-	13VG308ASIR II, 13VG1040ASIR, TG4Z2813FCS-IR-2
		MINI	28MMA-M12-140	2520BC-12, 2920BC-12, 3820BC-12, 0625BC-12, 0814BC-12, 0820BC-12, 1220BC-12, M1616BC-12, 2540EX014-M12
	WAT-600CX	CCTV	-	13VG308ASIR II, 13VG1040ASIR, TG4Z2813FCS-IR-2
		MINI	30.5MMA-M12-120	2520BC-12, 2920BC-12, 3820BC-12, 0625BC-12, 0814BC-12, 0820BC-12, 1220BC-12, M1616BC-12, 2540EX014-M12
	WAT-230V2(G3.6)	MINI	-	2520BC-12, 2920BC-12, M3620BC-12, 0625BC-12, 0820BC-12, 1220BC-12, M1616BC-12, 2540EX014-M12
	WAT-230V2/CS	CCTV	-	13VM308ASIR II, T4Z2813CS-IR-2
	WAT-240E(G3.8) WAT-240E/CB(G3.8) WAT-240E/FS(G3.8)	MINI	-	2520BC-12, 2920BC-12, 3820BC-12, 0625BC-12, 0820BC-12, 1220BC-12, M1616BC-12, 2540EX014-M12
WAT-1100MBD(G3.6)		MINI	-	M2520BC-12, M2920BC-12, M3620BC-12, M0620BC-12, M0816BC-12
W-03CDB3		CCTV	-	13VG308ASIR II, 13VG1040ASIR, TG4Z2813FCS-IR-2 *Utilize the option CC-02 (Iris cable) when a DC iris lens issued.
	MINI	22PMA-M12-125	2520BC-12, 2920BC-12, 3820BC-12, 0625BC-12, 0814BC-12, 0820BC-12, 1220BC-12, M1616BC-12, 2540EX014-M12	
Analog Monochrome	WAT-910HX WAT-910HX/RC	CCTV	30CMA-R	12VG412ASIR, 12VG1040ASIR
		MINI	28MMA-M12-140	0814BC-12
	WAT-902H3 ULTIMATE	CCTV	-	13VG308ASIR II, 13VG1040ASIR, TG4Z2813FCS-IR-2
		MINI	28MMA-M12-140	2520BC-12, 2920BC-12, 3820BC-12, 0625BC-12, 0814BC-12, 0820BC-12, 1220BC-12, M1616BC-12, 2540EX014-M12
	28MMA-M12-090		3720B-12P(B)	
	WAT-902H2 ULTIMATE	CCTV	30CMA-R	12VG412ASIR, 12VG1040ASIR
		MINI	28MMA-M12-140	0814BC-12
	WAT-902H3 SUPREME	CCTV	-	13VG308ASIR II, 13VG1040ASIR, TG4Z2813FCS-IR-2
			22PMA-M12-125	2520BC-12, 2920BC-12, 3820BC-12, 0625BC-12, 0814BC-12, 0820BC-12, 1220BC-12, M1616BC-12, 2540EX014-M12
		MINI	22PMA-M13-040	3745B-13P
	WAT-902H2 SUPREME	CCTV	30CMA-R	12VG412ASIR, 12VG1040ASIR
			22PMA-M12-125	0814BC-12
		MINI	22PMA-M13-040	3745B-13P
	WAT-902B	MINI	22PMA-M12-125	0814BC-12
			22PMA-M13-040	3745B-13P
	WAT-660E(G3.8)	MINI	-	2520BC-12, 2920BC-12, 3820BC-12, 0625BC-12, 0820BC-12, 1220BC-12, M1616BC-12, 2540EX014-M12
	WAT-910HX MBD(G3.6)	MINI	-	2520BC-12, 2920BC-12, M3620BC-12, 0625BC-12, 0820BC-12, 1220BC-12, M1616BC-12, 2540EX014-M12
WAT-902HB3S	MINI	22PMA-M12-125	2520BC-12, 2920BC-12, 3820BC-12, 0625BC-12, 0814BC-12, 0820BC-12, 1220BC-12, M1616BC-12, 2540EX014-M12	
		22PMA-M13-040	3745B-13P	
WAT-902HB2S	MINI	22PMA-M12-125	0814BC-12	
		22PMA-M13-040	3745B-13P	
WAT-910BD	CCTV	30CMA-R	12VG412ASIR, 12VG1040ASIR *Utilize the option CC-01 (Iris cable) when a DC iris lens issued.	
	MINI	22PMA-M12-125	0814BC-12	
22PMA-M13-040		3745B-13P		

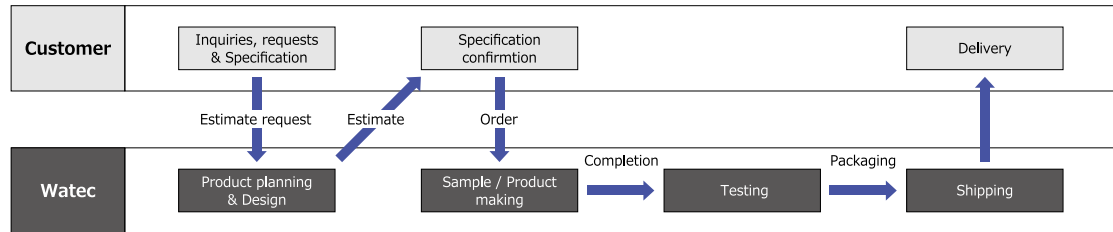
## ■ Glossary

<b>External Synchronization</b>	Function to synchronize the timing of cameras' motion when multiple cameras are used simultaneously (Composite Sync. of sync. signal generators and CVBS signal of cameras are applied for the timing synchronization.)
<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>Day/Night</b>	Function to provide color image under sufficient illumination & B/W image under low-light condition automatically, manually
<b>One-cable System</b>	Transmission system to send video signal & receive power supply via 1 coaxial cable to facilitate cable routing
<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-30HD)
<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

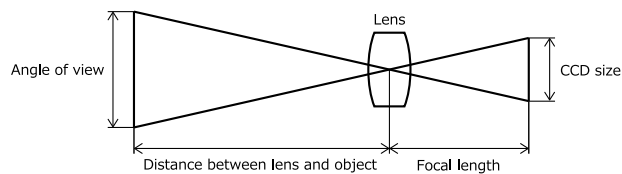
### Guide of Minimum Illumination

#### 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

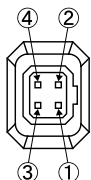
### Calculation of the Focal Length

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



CCD size(mm)
1/2" = 4.8(H)×6.4(W)
1/3" = 3.6(H)×4.8(W)
1/4" = 2.7(H)×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: 5, Auditor: 1
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 liaison office 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

#### **Watec Co., Ltd. (Head office)**

254-2 Nihonkoku, Daihoji, Tsuruoka-Shi, Yamagata-Ken, 997-0017, Japan

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

7F O.K Build. 5-5-10 Sotokanda, Chiyoda-ku, Tokyo, 101-0021, Japan

#### **Factory**

1518-3 Tatenokoshi, Kanisawa, Higashine-Shi, Yamagata-Ken, 999-3716, Japan





