

4K VARIABLE FRAME RATE CAMERA

FT-ONE-LS



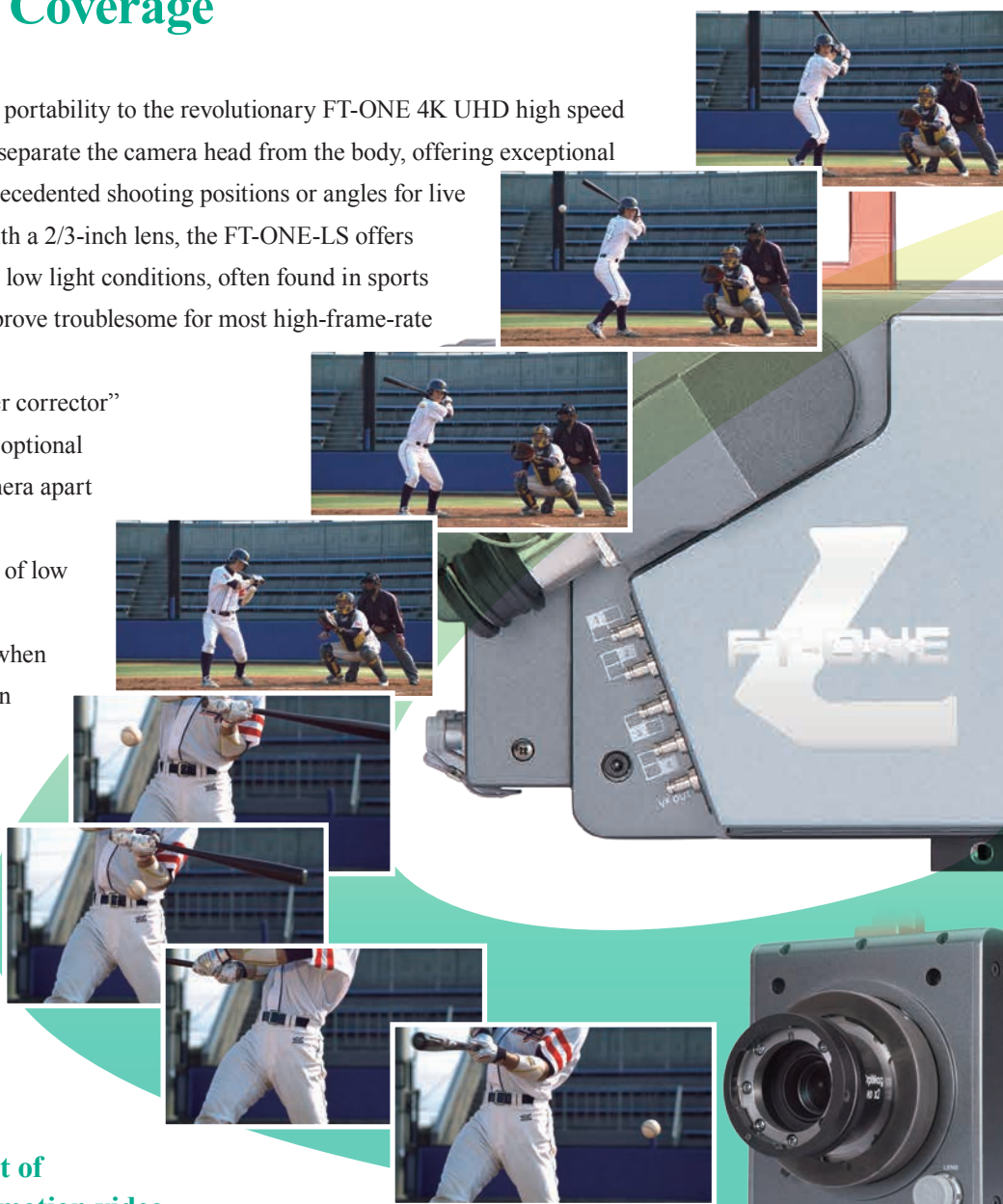
Camera lenses are sold separately.

The Perfect High-Speed 4K Camera for Live Sports Coverage

Adding compact size and portability to the revolutionary FT-ONE 4K UHD high speed camera, the FT-ONE-LS separate the camera head from the body, offering exceptional mobility, and enable unprecedented shooting positions or angles for live sports or other events. With a 2/3-inch lens, the FT-ONE-LS offers improved performance in low light conditions, often found in sports stadium venues that can prove troublesome for most high-frame-rate cameras.

FOR-A's exclusive "flicker corrector" technology, offered as an optional feature, helps set this camera apart from all others.

No longer will the effects of low light and high-speed 4K production be a concern when shooting night games or in domed stadiums.



Simultaneous output of live and super slow-motion video

Simultaneous output of live and super slow-motion video makes FT-ONE-LS more than a dedicated high-speed solution. The cameras are also ready for live workflows of all kinds.

Move the camera head around to capture video during super slow-motion playback

While playing back super slow-motion coverage, the operator has the ability to turn off the camera head and move around to capture the next crucial shot. Unbeatable versatility! This is especially useful when covering live action events requiring mobility. With its camera head linked to the base station over a single optical camera cable, the FT-ONE-LS have a maximum extended range over a mile*¹. Additionally, footage can be captured at the base station on no more than two SSD cartridges, with a maximum storage capacity of 4 TB.



*¹ When using a camera cable longer than 1 km, an external power supply may be necessary.

Features

- Shoots up to 500 frames per second (fps) in 4K, up to 1200 fps in HD
- Supports 2 x SSM in 4K 60p or 6 x SSM in HD 60i. Works with EVS XT-3
- High speed shutter: Down to 1/50,000 second with blur-free shots
- Recording time: Up to 19.6 sec of 4K DCI recording at 500 fps
- SSD cartridge (optional) allows up to 76,000 frames (FT-ONE2T), or 38,000 frames (FT-ONE-ITL) of 4K RAW data to be recorded.



Storage partitioning

The internal memory on the the FT-ONE-LS can be used as a single partition or divided into 2-16 partitions for simultaneous recording or playback. For continuous recording, material can be left intact prior to recording the next segment. Partitioning allows the operator to record new scenes while playing back already recorded ones.

Versatile trigger support

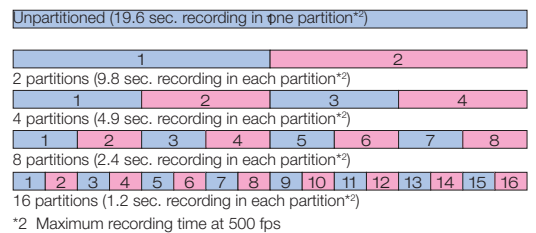
As soon as the the FT-ONE-LS is turned on, video is constantly being buffered by the camera and can instantly be saved to memory with the push of a button. Choose the optimal recording trigger for the subject or scene by selecting from a start, center, or end trigger or by specifying the start time of the recorded segment. With the pre-roll function, playback starts from the specified position, keeping playback focused on required segments.

24-axis color correction

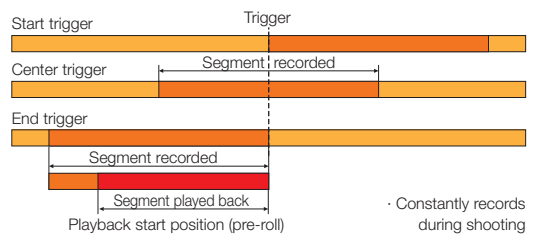
The video operator will be awed by the amazing 24-axis color correction, offering improved camera and color matching compared to the usual trichromatic correction. Specific colors can be corrected by adjusting hue and saturation separately on the 24-axis. This is very convenient for on-site color-matching between scenes, or when ensuring color consistency with video from other cameras. Choose from a variety of color presets*3 or, import your own.

Triple intercom connectivity

Intercoms are indispensable when it comes to live coverage. With both a D-sub and XLR connector, the camera easily fits into live workflows, supports 2-wire, 4-wire, or Clear-Com® connections.



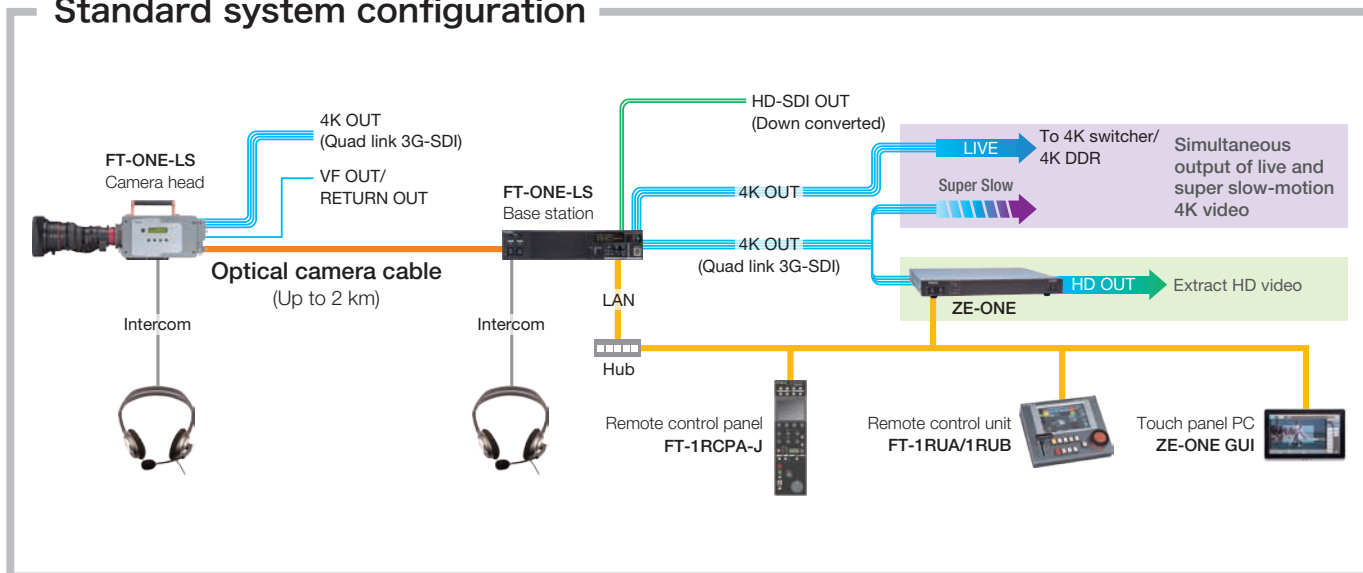
*2 Maximum recording time at 500 fps



*3 For details, contact a FOR-A representative.

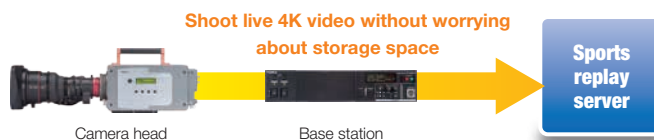


Standard system configuration



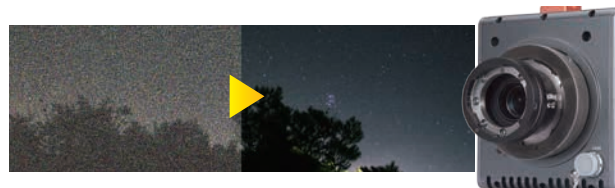
Live output at 2 x SSM for 4K

Connected to EVS sports replay server, the FT-ONE-LS provide impressive output of high-speed video. Material on the server can also be replayed as needed. The units also offers capability of long-duration recording in HD at 6x speed.



Outstanding video images –even with a B4 lens

High-quality video images are maintained even with gain increased for video captured with a 2/3-inch mounted lens. Operators will see significantly less noise, which tends to occur in low-light conditions.



High frame rate output ready for editing

Output rates of up to 500 fps in 4K or 1,200 fps in HD are supported.



Flicker correction

The optional Flicker Corrector offered on cameras, corrects, in real-time, that annoying flickering often put out by high-speed cameras when shooting under inconsistent lighting conditions. This option is a must-have for indoor live sporting events, especially when shooting night games or in domed stadiums or gymnasiums.



Options

SSD Cartridge FT-ONE2T/FT-ONE-1TL

- Transfer material recorded on the FT-ONE-LS to an SSD cartridge.
- One FT-ONE2T cartridge holds up to 152 seconds of material.
- An cost-effective cartridge with half the capacity is also available: the FT-ONE-1TL.*
- Accommodates two cartridges, which can hold nearly five minutes of material.
- Switch the hot-swappable cartridges as needed when shooting.

*Not suitable for real-time playback due to low frame rates.



FT-ONE2T: SSD Cartridge

Cartridge Docking Station FT-1CDS

- Provides USB 3.0 connectivity between the FT-ONE-LS Cartridge (FT-ONE2T or others) and a Windows or macOS computer.
- Copy material from the SSD cartridge directly to storage on the computer or to an attached HDD or SSD
- Provides color gamut adjustments, 3D-LUT creation*, and computer-based playback of material on the SSD cartridge
- Can be used outdoors when powered via the IDX battery mount.

*Windows supported



Remote Control Unit FT-1RUA/FT-1RUB

- Includes direct recording and playback buttons as well as a dial and touch-panel for a range of settings.
- Facilitate camera setup, recording, and playback.
- Intuitive controllers with a fader control



DPX Converter FT-1READ

Converts 12-bit RAW data on the FT-ONE SSD cartridge to a common file format for editing or color grading.

Accessories

Tripod adapter, AC cord, rack mount brackets, rubber feet, operation manual

4K Extraction System ZE-ONE

Award-winning:
TVB Europe
"Best of IBC 2013"



Frame and extract specified HD scenes at any size from 4K sources using an intuitive touch-screen interface*. To simulate zooming, dynamic zoom effects at key points and in various sizing can be specified in slow-motion instant replay from the FT-ONE-LS high-speed 4K camera. Enjoy unprecedented creative freedom with replays of live sports and other applications.



* Control software for Windows 7 or Windows 8 computers is provided to enable touch and mouse operation.

- Extract HD (1080i or 720p) output from 4K Quad Link 3G-SDI input
- Isolate and enlarge the action
- Easy touchscreen-based framing and extraction
- Smoothly zoom in or out
- Compatible with the FT-ONE-LS
 - Simulate dynamic and flowing camerawork by setting replay extraction points and frame sizes
 - Perfect for capturing the excitement by zooming in on the action in slow-motion replays
- Includes an embedded audio delay processor (16 channels)

Remote Control Panel FT-1RCPA

- Remote control panel for image/color adjustment
 - Real-time control is available via button, touchscreen and dial.
 - Iris control is available via joy-stick (FT-1RCPA).
- Image is for illustration purposes only.



Connector Conversion Cables

Conversion cables from waterproof camera head connectors to general-purpose connectors

FOR-A® Head Office: 3-8-1 Ebisu, Shibuya-ku, Tokyo 150-0013, Japan

FOR-A Corporation of America Corporate Office/Service Center: Tel: +1 714-894-3311
11155 Knott Ave., Suite G, H & I, Cypress, CA 90630, U.S.A.

FOR-A Corporation of America Northeast Office: Tel: +1 973-220-8471
1360 Clifton Ave., Clifton, NJ 07012, U.S.A.

FOR-A Corporation of America Southeast Office: Tel: +1 305-773-7608

FOR-A Corporation of America Support Center: Tel: +1 352-371-1505
2400 N.E. Waldo Road, Gainesville, FL 32609, U.S.A.

FOR-A Latin America and the Caribbean Miami Office: Tel: +1 657-600-5759

FOR-A Latin America and the Caribbean Sao Paulo Office: Tel: +55 (0)11-99913-3751

FOR-A Europe S.r.l.: Tel: +39 039-916-4811
Via Volturmo, 37, 20861 Brugherio MB, Italy

FOR-A UK Limited: Tel: +44 (0)20-3044-2935
Trident Court, 1 Oakcroft Road, Chessington, KT9 1BD, UK

FOR-A Italia S.r.l.: Tel: +39 039-881-086/103
Via Volturmo, 37, 20861, Brugherio MB, Italy

FOR-A Corporation of Korea: Tel: +82 (0)2-2637-0761
1007, 57-5, Yangsan-ro, Yeongdeungpo-gu, Seoul 07271, Korea

FOR-A China Limited: Tel: +86 (0)10-8721-6023
1618 Huateng Building, No. 302, 3 District, Jinsong, Chaoyang, Beijing 100021, China

FOR-A Middle East-Africa Office: Tel: +971 4-551-5830
DSC Tower, Office 207, Dubai Studio City, P.O. Box 502688, Dubai, UAE

FOR-A India Private Limited. Corporate Office: Tel: +91-120-04238674/+91-120-4252330
Unit No: 800, 8th Floor, World Trade Tower "B", C-1, Sector-16, Noida-201301, Uttar Pradesh, India

FOR-A India Private Limited. Mumbai Office: Tel: +91-022-49795570
202-203, 2nd Floor, Wellington Business Park No-01, Marol, Off, Andheri Kurla Road, Andheri East, Mumbai-400059, Maharashtra, India

FOR-A South East Asia Office: Tel: +852 2110-9227
Studio 09, Rm. A1, 3/F., Phase 1, Hang Fung Ind. Bldg., 2G Hok Yuen St., Hung Hom, Hong Kong

ISO 9001 and 14001 certified
(Sakura R&D)

www.for-a.com

FT-ONE-LS

Specification

Camera Head

Image sensor, shutter, other

Sensor	CMOS sensor
Effective resolution	4096 x 2160
Sensor size	Super 35 mm-equivalent
Color filter	RGB Bayer
Shutter mechanism	Global shutter
Quantization	12-bit x RGB
Shutter speed	1/frame rate to 1/50,000 sec. (Preset stops)
Frame rate	4K High Speed mode: Max. 500 fps HD High Speed mode: Max. 1,200 fps 4K 2x Speed mode: 100 fps / 120 fps (depending on system frequency) HD 3x Speed mode: 150 fps / 180 fps (depending on system frequency) HD 6x Speed mode: 300 fps / 360 fps (depending on system frequency)
Lens mount	PL mount
Trigger method	Arbitrary positions from START, 10%-45%, CENTER, 55%-90%, END Pre-roll function: Adjustable playback position on FT-1RUA/RUB
Trigger signal input	From Remote Control Unit (FT-1RUA/RUB), GPI or camera button.

Video settings

Gain	Digital: 0 - 42 dB (0.1 dB increments) Analog: 0 dB, 6 dB, 12 dB
White balance	PRESET: 3200K, 5600K, 6500K, 9300K Semiautomatic correction
Pedestal	Black level set via R, G, B, Master
Color correction	Linear matrix: Phase R-G, R-B, G-R, G-B, B-R, and B-G Hue and Saturation adjustments on 24-axis
Gamma	Linear($\gamma=1.0$), $\gamma=0.45$, $\gamma=0.50$, HDTV, CINEMA, LOG
Knee	Knee point and Knee slope setting
Enhancement	On/Off, horizontal (H), vertical (V)
Chroma gain	Pb, Pr

Audio inputs

MIC IN	EEG.0T.305.CLL x 1 (1 stereo pair), balance, high impedance Input level: -60 dBu / -50 dBu / -40 dBu Phantom power supply: +48 V / OFF
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Audio output

Embedded	2 channels (1 stereo pair), 48 kHz, synchronous
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Camera mode	
4K mode	4K High Speed mode 4K 2x Speed mode
HD mode	HD High Speed mode HD 3x Speed mode HD 6x Speed mode
Video outputs	
4K OUT 1-4	75Ω DIN 1.0/2.3 x 4 Live video 4K High Speed mode: x1 (3840 x 2160p) / 59.94, 50 (4:2:2) 3G-SDI x 4, SQD (Level-A/B, SQD)
VF OUT	HD High Speed mode: x4 (1920 x 1080p) / 59.94, 50 (1920 x 1080i) / 59.94, 50 75Ω DIN 1.0/2.3 x 1 4K High Speed mode: 4K-downconverted live, slow or RET1/RET2 input video 4K 2x Speed mode: 4K-downconverted live, or RET1/RET2 input video HD High Speed mode: Live, slow or RET1/RET2 input video HD 3x Speed HD 6x Speed modes: Live or RET1/RET2 input video
External Interfaces	
GPI	EEG.0T.309.CLL (Lemo connector) x 1 GPI IN1-6, R TALLY OUT, G TALLY OUT
Iris control	EEG.2T.312.CLL (Lemo connector) x 1 Manual / Auto
Intercom headset	EEG.0T.304.CLL (Lemo connector) x 1 PRIV / LINE (producer line / engineer line)
Optical camera cable port	Manufactured by Lemo
General specifications	
Temperature	0°C to 40°C
Humidity	30% to 85% (no condensation)
Power	Supplied from the base station, via optical camera cable or an external power supply: 100 V to 240 V AC (Max. 1 km) DC IN: EEG.2T.302.CLL (Lemo connector) x 1, DC+12 to +17V DC OUT: EEG.2T.303.CLL (Lemo connector) x 1, DC+12 to +17V (Max. 20 W)
Consumption	74 W
Dimensions	153 (W) x 148(H) x 336 (D) mm (excluding projecting parts)
Weight	7.1 kg
Consumables	Cooling fan (P-1552-1): Replace every 4 years (at normal temperature)

Base Station

Video output (camera mode) (See p. **エラー!ブックマークが定義されていません。** for more details)

CH A1-4	4K mode	x 2 (3840 x 2160p) / 59.94, 50 (4:2:2)
CH B1-4		3G-SDI x 4, SQD (Level-A/B, SQD)
	HD mode	x 8 (1920 x 1080i/p) / 59.94, 50
	75Ω BNC x 8	Live or slow video
HD SDI 1-2	4K/HD mode	x 2 (1920 x 1080i): 1080i / 59.94, 50
	75Ω BNC x 2	Live or slow video

Video input

RET 1	(1920 x 1080i) / 59.94, 50
RET 2	75Ω BNC x 2

Genlock input

BB: NTSC: 0.429 Vp-p, PAL: 0.45 Vp-p or,
Tri-level Sync: 0.6 Vp-p
75Ω BNC x 1 (w/ loophrough, 75-ohm auto termination)

Genlock mode

Internal sync or External sync (B.B. or Tri-level sync)

Memory partition

1 to 16 segments

Recording duration

4K High Speed			HD High Speed		
Frame rate (major)	Recording time	Image size	Frame rate (major)	Recording time	Image size
24 fps	409.2 sec	4096×2160 pixel	24 fps	1365.2 sec	1920×1080 pixel
50 fps	196.4 sec		50 fps	655.3 sec	
60 fps	163.6 sec		60 fps	546.1 sec	
100 fps	98.2 sec		100 fps	327.6 sec	
120 fps	81.8 sec		120 fps	273.0 sec	
150 fps	65.4 sec		150 fps	218.4 sec	
200 fps	49.1 sec		180 fps	182.0 sec	
240 fps	40.9 sec		300 fps	109.2 sec	
300 fps	32.7 sec		360 fps	91.0 sec	
350 fps	28.0 sec		480 fps	68.2 sec	
360 fps	27.2 sec		500 fps	65.5 sec	
400 fps	24.5 sec		600 fps	54.6 sec	
480 fps	20.4 sec		750 fps	43.6 sec	
500 fps	19.6 sec		900 fps	36.4 sec	
* Audio are not recorded.			1050 fps	31.2 sec	
			1200 fps	27.3 sec	

SSD cartridge slots

(For FT-ONE2T/FT-ONE-1TL option)

No of slots

2

Replacement method

Hot-swap supported with no access

Intercom system

COMMUNICATION

25-pin D-sub (female) x 1
Intercom x 2 lines (ENG/PROD) if 4WIRE or 2WIRE selected.
PGM 2 lines
GPI 2 inputs (Default: R TALLY IN, G TALLY IN)

HEAD SET

4-pin XLR (male) x 1 (For intercom connection)

INTERCOM IN1, IN2

3-pin XLR (male) x 2 (when Clear-Com is selected)

Interface	
LAN	100BASE-TX/1000BASE-T RJ-45 x 1 (For FT-1RUA/RUB and FT-1RCP connection)
Optical camera cable connector	Manufactured by Lemo
Flicker correction (Option)	Applicable to live and recorded footage in built-in memory and SSD cartridges, in real time. (Not applicable to VF-OUT and HD-SDI 1/2) FT-1RUA/RUB required for flicker correction control.
Temperature	0°C to 40°C
Humidity	30% to 85% (no condensation)
Power	AC IN: 100 V to 240 V AC * Camera power supply is available using a camera optical cable (max: 1 km).
Power consumption	Single operation: 268 W (at 100-120V) 268 W (at 220-240V) If camera head is connected: 389 W (at 100-120V) 381 W (at 220-240V)
Dimensions	430 (W) x 88(H) x 500 (D) mm (excluding projecting parts)
Weight	15.4 kg
Consumables	Cooling fan (P-1546-2): Replace every 4 years (at normal temperature) Button battery (for memory backup) CR2032 : Replace every 5 years (at normal temperature) Fuse: Slow blow 5.2x20 mm, 5.0 A / 250 V

SSD Cartridge (Option) Specifications

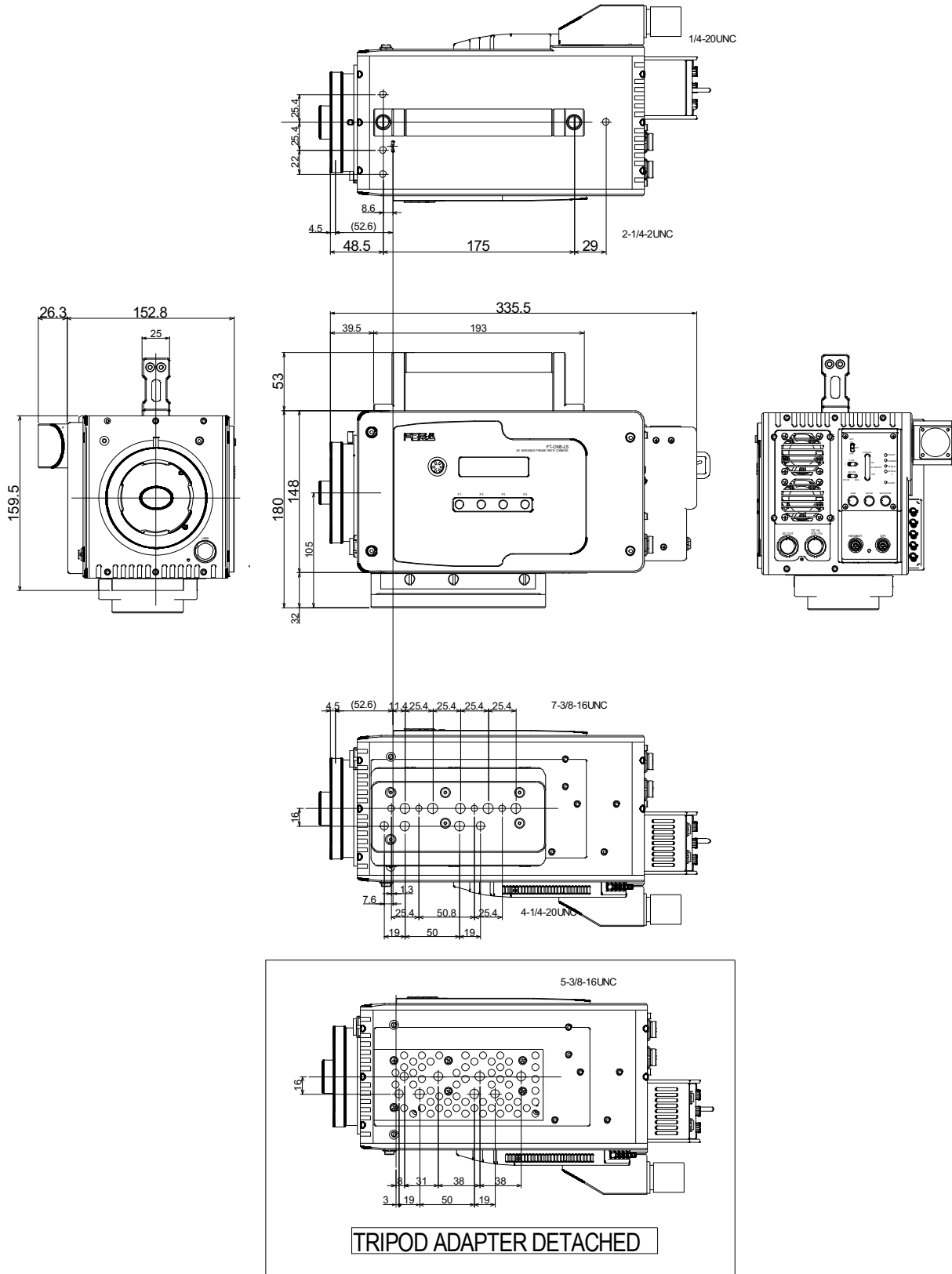
Model	FT-ONE2T	FT-ONE-1TL
Capacity	76,000 frames	38,000 frames
Recording speed	Apr. 27 sec/1,000 frames	Apr. 27 sec/1,000 frames
Playback frame rate	60 fps (max)	60 fps (max) *
Weight	0.6 kg	0.6 kg

* In rare cases, a frame may be output twice when playing back at a frame rate higher than 15 fps.

Dimensions

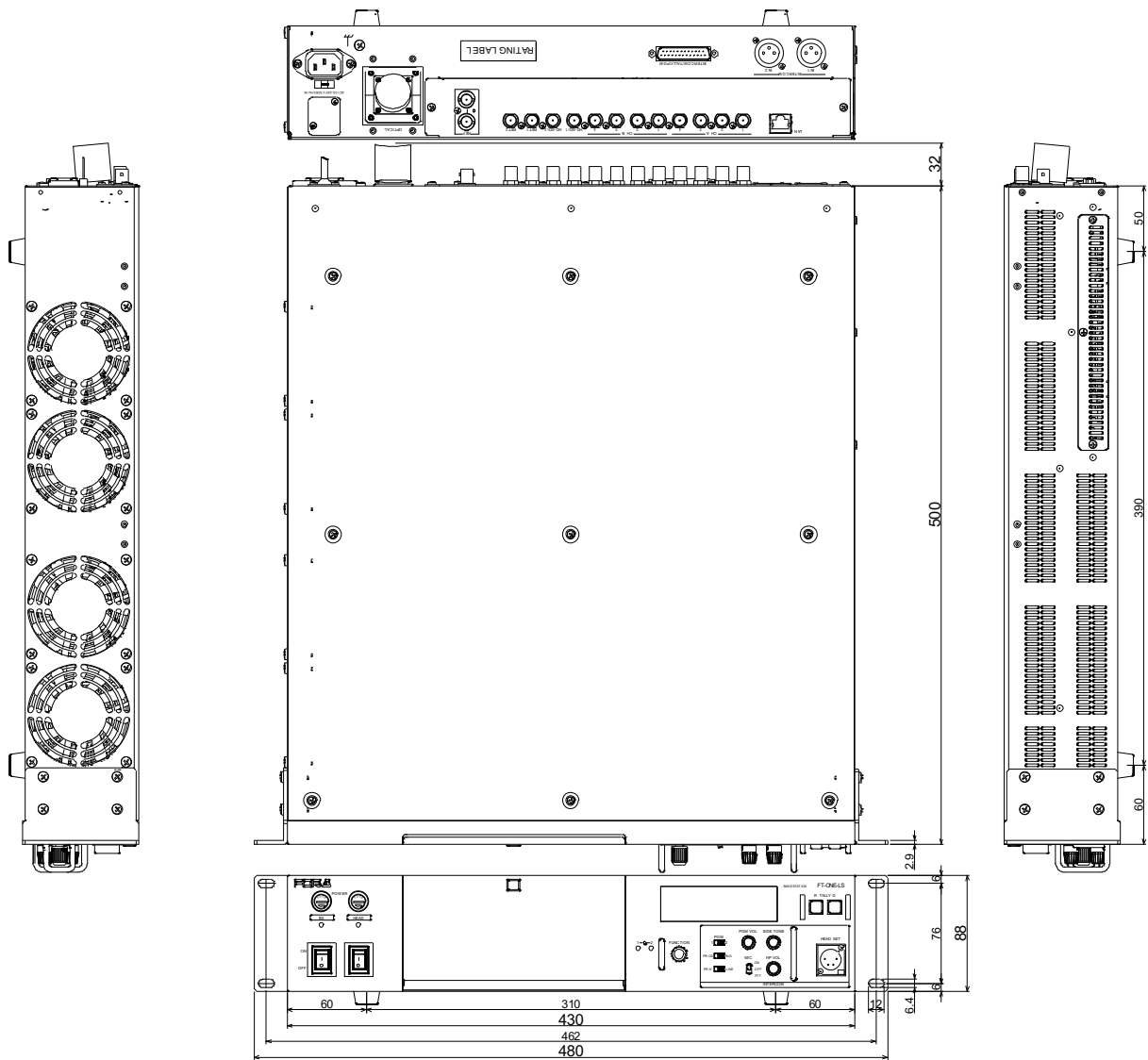
FT-ONE-LS (Camera Head)

(All dimensions in mm)



FT-ONE-LS (Base Station)

(All dimensions in mm)



FT-ONE2T / FT-ONE-1TL

(All dimensions in mm)

