

**Canon**

**DIGISUPER 86 XS**

**DIGISUPER 86TELE XS**



*ULTRA HIGH ZOOM RATIO FIELD LENS  
WITH IMAGE STABILIZER-  
A TECHNOLOGY BREAKTHROUGH*



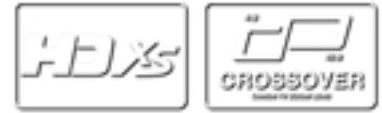
# DIGISUPER 86 XS

**XJ86x9.3B IE 9.3-800mm 1:1.7**



# DIGISUPER 86 TELE XS

**XJ86x13.5B IE 13.5-1161mm 1:2.4**



**HDXS:** The letters "XS" come from the word "Excess", an indication that the new generation of **HDXS** lenses exceeds all conventional lens specifications and concepts by using breakthrough technologies. **HDXS** allows for higher specification lenses in smaller and lighter packages.

In addition to the current SDTV (NTSC/PAL) broadcasting system, in excess of 180 television stations in the United States have started Digital terrestrial broadcasting since Nov.1, 1998. Most of the DTV stations are now broadcasting HDTV where the scanning lines are double that of SDTV, or will be doing so in the near future.

Knowing the requirements for HDTV, Canon has developed the DIGISUPER 86xs and DIGISUPER 86TELExs to meet and exceed those demanding performance specifications. Further enhancing the DIGISUPER 86xs series is Canon's latest built-in stabilization method, Shift-IS, a standard feature of both lenses.

## HD Optical Performance with an 86x Zoom Ratio and improved Wide Angle

The DIGISUPER 86xs & DIGISUPER 86 TELE xs are powerful field lenses that utilize Canon's unique optical design concept, the "POWER OPTICAL SYSTEM" with "X-Element". By adopting this new technology and concept, they meet the optical performance required for HDTV, with the increased zoom ratio of 86x as well as an improved wide angle. All of these new specifications were made possible while still maintaining the size equivalent to that of current SDTV field lenses.

## X-Element & POWER OPTICAL SYSTEM

Canon has developed this breakthrough optical design concept using a newly developed optical element in the most effective way. We have named the new design concept the "Power Optical System" which achieves higher specifications and quality using the new optical "X-Element" which virtually eliminates aberrations.

## Latest Generation DIGITAL SERVO SYSTEM

Canon's latest generation digital servo system

allows the use of many new functions such as constant angle of view while focusing "CAFS" and the selection of different servo characteristics.

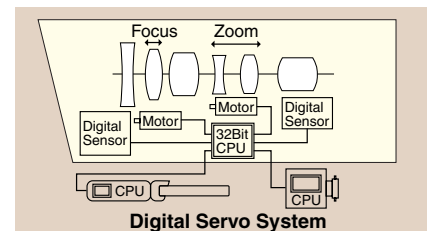
These functions are only possible with a digital servo system. In addition to these new functions, the upgrading of software will be possible when new functions become available in the future. This means that the DIGISUPER 86xs & DIGISUPER 86 TELExs have unlimited possibilities.

## "CAFS" Constant Angle Focusing System

The zooming effect of focus is the phenomena where the picture size (angle of view) changes when focusing (breathing). However, a 32bit CPU calculates and controls the zoom when focusing in order to counteract these phenomena. Thus the DIGISUPER 86xs & DIGISUPER 86TELExs have ZERO zooming effect of focus throughout the whole zoom range.

## CROSSOVER COMPATIBILITY

Available optionally is the dual aspect ratio switching system, "CROSSOVER", for switchable 16:9/4:3 cameras.



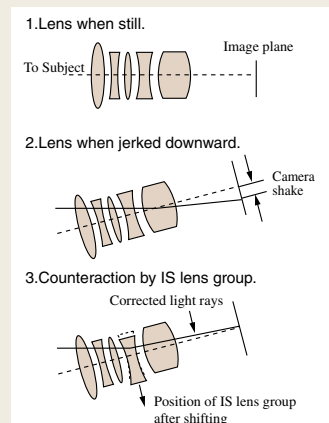
## Image Stabilizer

The history of field lenses is a history of zoom ratio/focal length extension. It came to a point where the industry thought it would be impossible to push the envelope any further. The telephoto focal lengths of the lens got so long that even the slightest amount of wind or operator movement would cause image shake and viewing the picture became intolerable, this was before Canon announced the incredible magnification DIGISUPER 86 xs zoom lens at NAB 2000. Canon, renowned for its optical image stabilization technologies, developed another new stabilization solution for the broadcast field lens, a built-in Optical Shift Image Stabilizer (Shift-IS) to overcome image shaking at telephoto focal length. Now the Shift-IS is employed in the DIGISUPER 86 xs & DIGISUPER 86TELE xs.

## Image Stabilizer

### How the Optical Shift Image Stabilizer (Shift-IS) Works

When the lens moves, the light rays from the subject are bent relative to the optical axis, resulting in an unsteady image because the light rays are deflected. By shifting the IS lens group on a plane perpendicular to the optical axis to counter the degree of image shake, the light rays reaching the image plane can be steadied. Since image shake occurs in both horizontal and vertical directions, two shake-detecting sensors for yaw and pitch, detect the angle and speed of movement and send this information to a high-speed 32-bit microcomputer, which converts the information into drive signals for the IS lens group. Then the actuator moves the IS lens group horizontally and vertically thus counteracting the image shake and maintaining the stable picture. The Shift-IS component is located within the lens groups and is most effective for lower frequency movements caused by platform vibration or wind effect without increasing the overall size and weight of the master lens.



### INTERNAL FOCUSING SYSTEM

- (Advanced 3 group IF system)
- Realization of wide-angle with reduced distortion.
  - Minimized variation of chromatic aberration while focusing.
  - Anti-Dust, Anti-Fog, thanks to a perfectly airtight Internal Focusing System.
  - Minimized variation of the centre of gravity through focus movement.

### Image Stabilizer

#### "CAFS"

#### -Constant Angle Focusing System-

- When focus is operated, the angle of view is maintained by synchronizing zoom movement.

#### ZOOM RATIO:86X

### CROSSOVER COMPATIBILITY (Optional)

- For use with 16:9/4:3 switchable cameras.

### 4 - POSITION TURRET

- (built in extender, master lens, crossover unit).
- Micro Computer Controlled Turret.

### VERSATILE ZOOM/FOCUS CONTROLLERS

(See figure on the next page)

- New ergonomic design.
- Countermeasures against dust, rain, and radio interference.

### HD OPTICAL PERFORMANCE

- Computer aided design in order to meet the higher level demanded by HDTV

### TELE ANGLE OF

- DIGISUPER 86 xs: 800mm, 1,600mm (2x Extender)
- DIGISUPER 86TELExs: 1,161mm, 2,322mm (2x Extender)

### WIDE ANGLE OF

- DIGISUPER 86 xs: 9.3mm
- DIGISUPER 86TELExs: 13.5mm

### COUNTERMEASURES AGAINST "GHOSTING" AND "FLARES"

### NEW GENERATION DIGITAL SERVO SYSTEM

#### SERVO SYSTEM MATCHING ROBOTIC REQUIREMENTS

- High resolution zoom and focus servo 13 bit repeatability.

#### 10 BIT IRIS COMPATIBILITY

- High resolution iris control.

#### WIDE DYNAMIC RANGE OF ZOOM AND FOCUS SERVO SPEED

- From ultra slow to high speed. Max. speed: Zoom 0.6 sec, Focus 0.8sec.

## SPECIFICATIONS

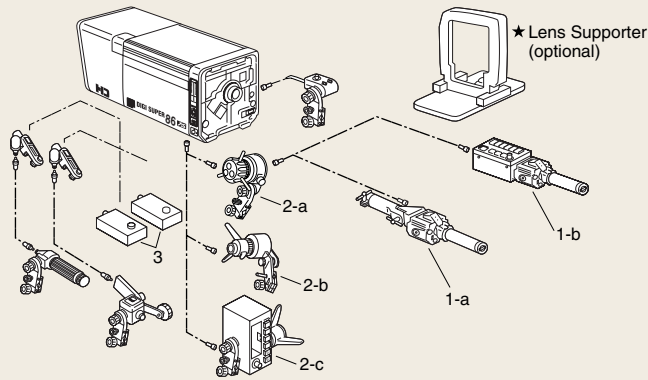
### DIGISUPER 86 XS

	NORMAL4:3		16:9		SWITCHABLE 4:3		
	1.0X	2.0X	1.0X	2.0X	1.0X	1.2X	2.4X
Built-in Extender							
Zoom Ratio	86X						
Range of Focal length	9.3-800mm	18.6-1600mm	9.3-800mm	18.6-1600mm	7.65-660mm	9.3-800mm	18.6-1600mm
Maximum Relative Aperture	1:1.7 at 9.3 ~ 340mm 1:4.0 at 800mm	1:3.4 at 18.6 ~ 680mm 1:8.0 at 1600mm	1:1.7 at 9.3 ~ 340mm 1:4.0 at 800mm	1:3.4 at 18.6 ~ 680mm 1:8.0 at 1600mm	1:1.7 at 7.65 ~ 340mm 1:3.3 at 660mm	1:1.7 at 9.3 ~ 340mm 1:4.0 at 800mm	1:3.4 at 18.6 ~ 680mm 1:8.0 at 1600mm
Angular Field of View	50.6°x39.1° 0.63°x0.47°	26.6°x20.1° 0.32°x0.24°	54.6°x32.4° 0.69°x0.39°	28.9°x16.5° 0.34°x0.19°	50.6°x39.1° 0.63°x0.47°	42.3°x32.4° 0.52°x0.39°	21.9°x16.5° 0.26°x0.19°
Minimum object Distance(M.O.D.)	3.0m from front lens vertex						
Object Dimensions at M.O.D.	253.9x190.4cm at 9.3mm 2.8x2.1cm at 800mm	127.0x95.2cm at 18.6mm 1.4x1.1cm at 1600mm	276.4x155.5cm at 9.3mm 3.1x1.7cm at 800mm	138.2x77.8cm at 18.6mm 1.6x0.9cm at 1600mm	253.9x190.4cm at 7.65mm 2.8x2.1cm at 800mm	206.2x155.7cm at 9.3mm 2.5x1.9cm at 800mm	103.8x77.9cm at 18.6mm 1.3x1.0cm at 1600mm
size	250.6(W)x255.5(H)x591.5(L)mm						
mass(Approx)	23.5kg (51.8lbs)						

### DIGISUPER 86TELE xs

	NORMAL4:3		16:9		SWITCHABLE 4:3		
	1.0X	2.0X	1.0X	2.0X	1.0X	1.2X	2.4X
Built-in Extender							
Zoom Ratio	86X						
Range of Focal length	13.5-1161mm	27-2322mm	13.5-1161mm	27-2322mm	11.1-955mm	13.5-1161mm	27-2322mm
Maximum Relative Aperture	1:2.4 at 13.5 ~ 480mm 1:5.8 at 1161mm	1:4.8 at 27 ~ 960mm 1:11.6 at 2322mm	1:2.4 at 13.5 ~ 480mm 1:5.8 at 1161mm	1:4.8 at 27 ~ 960mm 1:11.6 at 2322mm	1:2.4 at 11.1 ~ 480mm 1:4.75 at 955mm	1:2.4 at 13.5 ~ 480mm 1:5.8 at 1161mm	1:4.8 at 27 ~ 960mm 1:11.6 at 2322mm
Angular Field of View	36.1°x27.5° 0.43°x0.33°	18.5°x13.9° 0.22°x0.16°	39.1°x22.6° 0.47°x0.27°	20.2°x11.4° 0.24°x0.13°	36.1°x27.5° 0.43°x0.33°	29.9°x22.6° 0.36°x0.27°	15.2°x11.4° 0.18°x0.13°
Minimum object Distance(M.O.D.)	3.0m from front lens vertex						
Object Dimensions at M.O.D.	181.7x136.3cm at 13.5mm 2.1x1.6cm at 1161mm	90.9x68.2cm at 27mm 1.1x0.7cm at 2322mm	198.2x111.5cm at 13.5mm 2.3x1.3cm at 1161mm	99.1x55.7cm at 27mm 1.2x0.7cm at 2322mm	181.7x136.3cm at 11.1mm 2.1x1.6cm at 1161mm	148.7x111.5cm at 13.5mm 1.8x1.4cm at 1161mm	74.4x55.8cm at 27mm 0.9x0.7cm at 2322mm
size	250.6(W)x255.5(H)x618.4(L)mm						
mass(Approx)	24.3kg (53.6lbs)						

## RECOMMENDED LENS SYSTEM

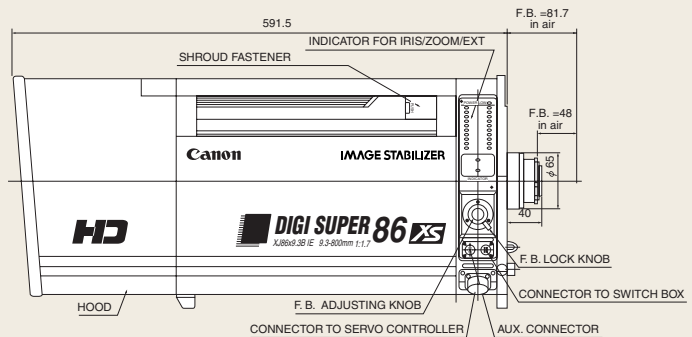
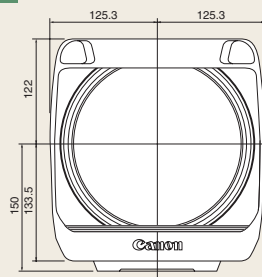


### Compatibility of Accessories for DIGISUPER 86 xs & DIGISUPER 86TELE xs

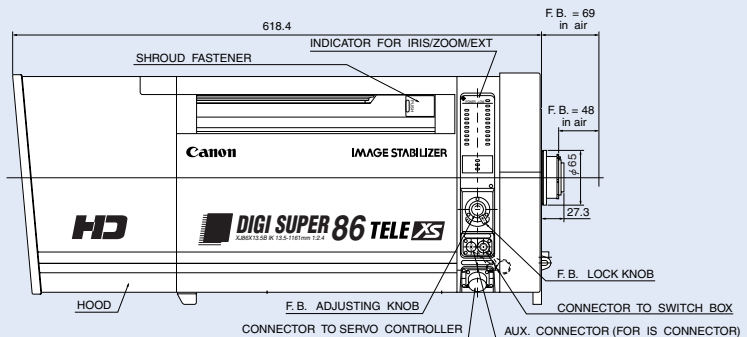
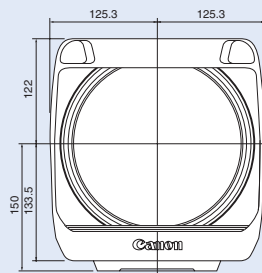
No.	DESCRIPTION	CODE
1-a	Digital Zoom Demand	ZDJ-D02 1822A066
1-b	Digital Zoom Demand W/Pre-set Box	ZPJ-D02
2-a	Digital Focus Demand	FDJ-D02 1822A065
2-b	Digital Focus Demand Propeller Type	FDJ-D12 0024T320
2-C	Digital Focus Demand W/Pre-set-Box	FPJ-D12
3	Digital Servo Module	SMJ-D01 1822A035

## DIMENSIONS

### DIGISUPER 86 xs



### DIGISUPER 86TELE xs



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