stryker®
ENDOSCOPY

Model 988
Medical Video Camera

Operating & Maintenance Manual

[redacted]

WARNINGS AND CAUTIONS

TO AVOID POTENTIAL SERIOUS INJURY TO THE USER AND THE PATIENT AND/OR DAMAGE TO THIS DEVICE, THE USER MUST:

1. Read this operating manual thoroughly and be familiar with its contents prior to using this equipment.
2. Carefully unpack the unit and check if any damage occurred during shipment. If damage is detected, please refer to the *Service and Claims* section in this manual.
3. Be a qualified physician, having complete knowledge of the use of this equipment.
4. Test this equipment prior to a surgical procedure. This medical video camera was fully tested at the factory before shipment.
5. Avoid removing covers on control unit to avoid electric shock and breaking of camera head seals.
6. Attempt no internal repairs or adjustments not specifically detailed in this operating manual.
7. Pay close attention to the care, cleaning, sterilization, and disinfection instructions in this manual. A deviation may cause damage.
8. DO NOT STERILIZE CAMERA CONTROL CONSOLE.
9. Disconnect the control unit from the electrical outlet when inspecting fuses.
10. Read the entire instruction manual before assembling or connecting the camera.

The camera warranty is void if any of these warnings are disregarded.

Stryker Endoscopy accepts full responsibility for the effects on safety, reliability, and performance of the equipment only if:

- Re-adjustments, modifications, and/or repairs are carried out exclusively by Stryker Endoscopy.
- The electrical installation of the relevant operating room complies with the applicable IEC, CEC, and NEC requirements.

WARNING *Federal law (United States of America) restricts this device to use by, or on order of a physician.*

Please read this manual and follow its instructions carefully. The words **WARNING**, **CAUTION**, and **NOTE** carry special meanings and should be carefully reviewed:

WARNING The personal safety of the patient may be involved. Disregarding this information could result in injury to the patient.

CAUTION Special service procedures or precautions must be followed to avoid damaging the instrument.

NOTE Special information to make maintenance easier or important information more clear.

An exclamation mark within a triangle is intended to alert the user to the presence of important operating and maintenance instructions in the literature accompanying the product.

A lightning bolt within a triangle is intended to warn of the presence of hazardous voltage. Refer all service to authorized personnel.

NOTE Stryker Endoscopy reserves the right to make improvements in the product(s) described herein. Product(s) therefore may not agree in detail to the published design or specifications. All specifications are subject to change without notice. Please contact the local Stryker Endoscopy Distributor listed in the *Other Service* section or phone your local Stryker Endoscopy sales representative or agent for information on changes and new products.

Ambient temperature range

Relative humidity range

Atmospheric pressure range

Denotes compliance to IEC 601-1 with amendments 1 & 2, CSA Std. C22.2 No. 601.1-M90, and UL Std. No. 2601-1.

Type BF Equipment as labeled on the product

Or

Type CF Equipment as labeled on the product

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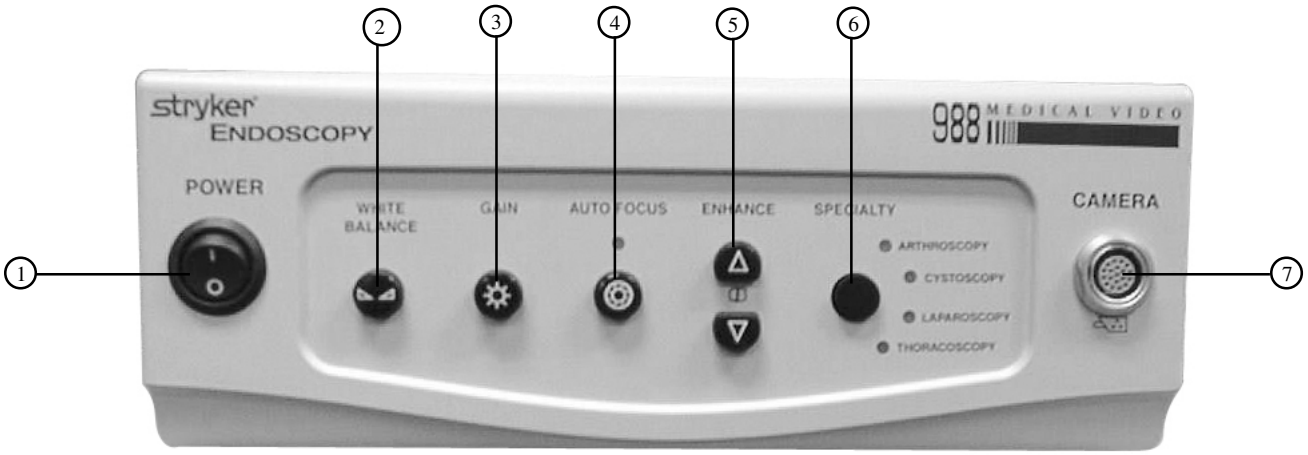
The Stryker Endoscopy Model 988 Medical Video Camera is designed for all types of video endoscopy applications. The Model 988 camera, with the proper coupler, can be used with most endoscopes or arthroscopes. Stryker Endoscopy's line of focusing camera couplers maximizes the surgeon's television viewing area for various endoscope sizes and applications. The light sensitivity and color reproduction of the Stryker Endoscopy system produces excellent picture quality.

A Stryker Endoscopy Model 988 Medical Video Camera consists of a camera head, a coupler, a camera control unit, and associated cables. These can be purchased together or separately. Stryker Endoscopy considers instructional training, or in-service, as an integral part of the Model 988 Medical Video Camera. Your local Stryker Endoscopy sales representative will perform at least one in-service at your convenience to help you set-up your equipment and instruct you and your staff on its operation and maintenance. Please contact your local Stryker Endoscopy representative to schedule an in-service after your equipment has arrived.

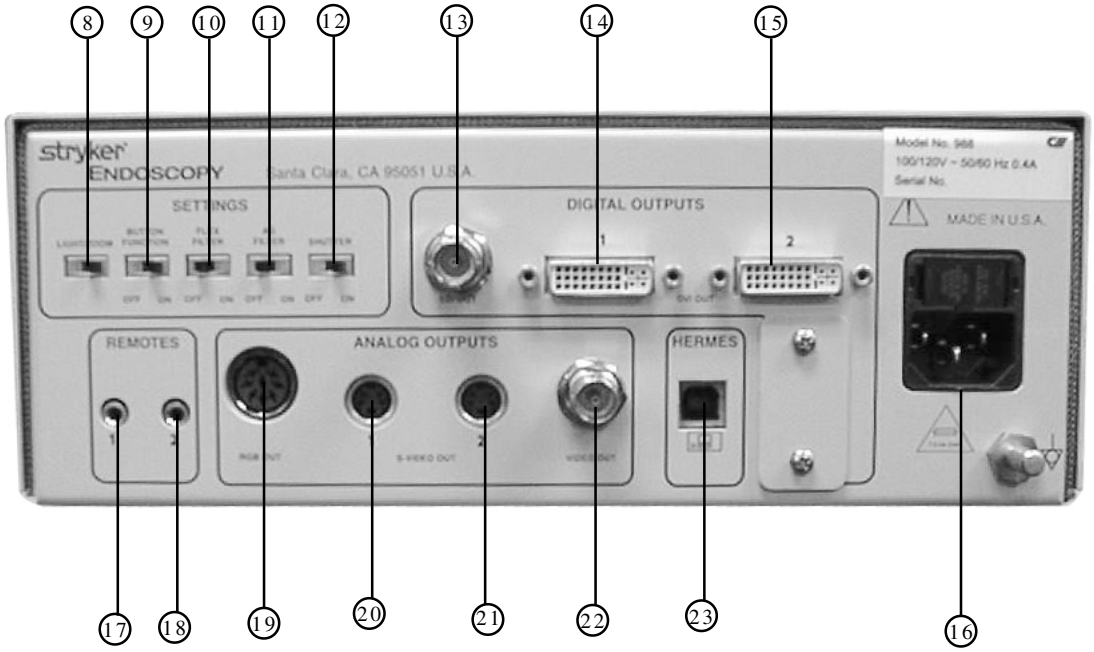
Description of Functions



Front Panel

1. **Power Switch** - Turns camera on or off.
2. **White Balance** - Begins WHITE BALANCE operation
3. **Gain** - Selects four levels of light sensitivity settings.
4. **AUTO Focus** - Turns Auto Focus on or off.
5. **Enhance ↑/↓ Buttons** - Increases/decreases sharpness.
6. **Specialty** - Selects **Arthroscopy**, **Cystoscopy**, **Laparoscopy**, **Thoracoscopy** surgical presets.
7. **Camera Connector** - Connection for the camera head.

Description of Functions continued



8. **LIGHT/ZOOM**- Selects either LIGHT or ZOOM function for the arrow buttons on camera head.
9. **Button Function** - Enables/Disables functions on camera head right ('W') button.
10. **Flex Filter** - Enables/Disables Flexible Scope Filter.
11. **AG Filter** - Enables/Disables Anti-Glistening Filter.
12. **Shutter** - Enables/Disables Auto Shutter.
13. **SDI Out** - Serial Digital Interface (SDI) Video Output.
14. **DVI Out 1** - Digital Video Interface (DVI) Video Output.
15. **DVI Out 2** - Digital Video Interface (DVI) Video Output.
16. **AC Power Input/Fuse** - Input for AC Power and Fuse
17. **Remote Out 1** - Output to Video Accessory Remote Switch.
18. **Remote Out 2** - Output to Video Accessory Remote Switch.
19. **RGB Out** - RGB/Component Video Output.
20. **S-VIDEO Out 1** - S-VIDEO Component Video Output.
21. **S-VIDEO Out 2** - S-VIDEO Component Video Output.
22. **Video Out** - NTSC Composite Video Output.
23. **Hermes** - Hermes Operating Room Control Center Interface Connection.

ATTACHING AND USING THE COUPLER

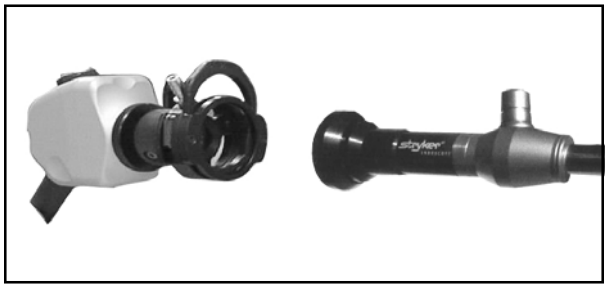


Figure 1

If a coupler is not already attached to the camera head when received, screw the coupler into the front of the camera head. Turn the coupler clockwise until it stops.

To attach an endoscope to the coupler, push down on the eyepiece clamp (as shown above) and remove the red dust cap if present. Push the eyepiece into the coupler and release the eyepiece clamp. (See Figure 1).

CAUTION Always treat the camera head with care. Dropping the camera head could cause damage.

C-MOUNT CAMERA SYSTEM

There are two camera heads: BF and CF applied part. While both the BF and CF camera head may be used with the 988 control unit, The CF model (Indentified by the heart logo) is specially designed for procedures with direct cardiac applications

WARNING: *When using more than one applied part simultaneously, patient leakage current may be additive. When using the 988 type CF camera head for cardiac applications, all other applied parts should be type CF rated to minimize total patient leakage current.*

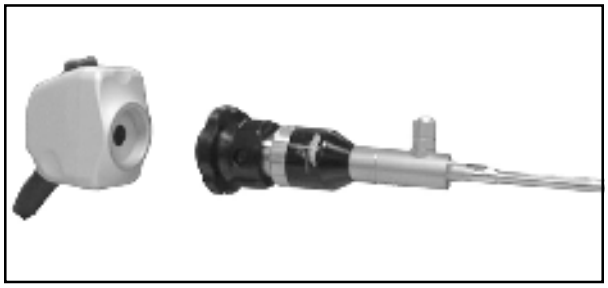


Figure 2

A direct-coupled endoscope may be attached to a C-mount camera head by threading the endoscope directly into the camera head. A coupler is not necessary in this case. (See figure 2).

CAUTION: Do not over tighten endoscope, as this may damage the front window of the camera.

TURNING ON THE CAMERA

Connect the power cord supplied with the camera to the AC inlet on the rear panel (16) and ensure that it is fully inserted. Connect the other end to a hospital grade AC receptacle.

WARNING *Always use a hospital grade power cord with this camera.*

Press the power switch (1).

WARNING *Test the video camera before each procedure begins. Ensure that a video image appears on all video monitors before beginning each procedure.*

CONNECTING VIDEO OUTPUT

Figure 3

Connect the S-VIDEO or BNC cable provided with the camera from VIDEO OUT to the VIDEO IN on a video monitor (Figure 3) and turn on the monitor.

NOTE When the camera head is not plugged into the CAMERA connector (7), a color bar pattern will appear on the video monitor.

WARNING *Do not touch the internal pin of the SDI and VIDEO OUT BNC jacks (13,22) and the patient simultaneously.*

ELECTROMAGNETIC INTERFERENCE

The camera has been designed and tested to comply with EN 60601-1-2: 1993 requirements for electromagnetic compatibility with other devices. If interference is experienced, refer to the *Troubleshooting* section in this manual.

CONNECTING THE CAMERA HEAD

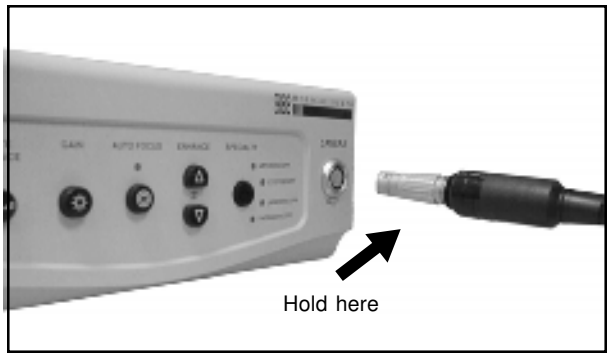


Figure 4

Unscrew (counter-clockwise) the soaking cap from the camera cable. Holding the connector by the knobbed portion only, plug the connector into the control unit by aligning the red dot on the cable connector with the red dot on the control unit CAMERA connector (7). Push in until it clicks (Figure 4). A picture should now be visible on the video monitor.

NOTE To unplug the camera from the control unit, grasp the knobbed portion of the connector only and pull straight out. This releases the connector latching mechanism.

CAUTION To avoid camera head cable damage do not severely bend, crush or cut the camera head cable.

WHITE BALANCE

The WHITE BALANCE switch (2) is used to correct slight color differences caused by using different light sources and endoscopes. With the light source and scope attached, point the scope at several stacked 4x4 white gauze pads, a white laparoscopic sponge, or any clean white surface. Look at the monitor and make sure that no glare is visible off of the white surface.

Press and hold the WHITE BALANCE button until “WB” begins flashing on the video monitor. Continue pointing the scope at a clean, white surface until the video monitor indicates that white balance is “OK.” The video picture will change color. If the video monitor indicates that white balance is “NOT GOOD,” repeat the process. If you cannot achieve a White Balance that is “OK”, refer to the *Trouble-shooting* section in this manual.

GAIN

The GAIN switch (3) increases the brightness of the video picture. There are four levels of gain: OFF, LOW, MEDIUM, and HIGH. Selecting a particular level establishes the GAIN range. OFF is the setting you should normally use.

If the picture is too dark and the light source is at full brightness, raise the light level by increasing the GAIN. The picture will get brighter but may also be more grainy. Text displayed on the screen indicates current gain level.

AUTO FOCUS

The Auto Focus button (4) turn the Auto Focus feature on or off. This feature maintains picture clarity throughout a larger depth of field than the coupler manual focusing ring alone.

Press the Auto Focus button to activate/deactivate the feature. Text displayed on the screen indicates the current state of the feature. After activating the feature, establish a good baseline focus using the coupler manual focusing ring, and then press a short pulse on the camera head ‘W’ button to set the baseline.

NOTE When the Auto Focus feature is activated, the enhance feature will be inoperative.

ENHANCE (↑/↓ BUTTONS)

The Enhance button (5) feature increase or decrease the picture sharpness. There are 8 levels of enhancement. Text displayed on the screen indicates current enhancement level.

Level 1 = No Enhancement
Level 8 = Maximum Enhancement

SURGICAL SPECIALTY

The Surgical Specialty selector switch (6) is used to select one of four surgical type settings:

Arthroscopy - Shutter programming optimized for small scopes, bright conditions, high contrast and low color.

Cystology - Shutter programming, color and lighting optimized for urology procedures.

Standard - Shutter programming optimized for large scopes and high color differentiation.

Thoracoscopy - Shutter programming, color and lighting optimized for Thoracic procedures.

Manufacturer presets will optimize the video performance for the surgery type selected. A green light will highlight the current selection (see front panel).

REAR PANEL CONNECTIONS

There are four analog and three digital video outputs on the rear panel. Analog outputs include one RGB (19) output, one NTSC Composite output, and two S-VHS outputs (20,21). Digital outputs include one SDI output (13) and two DVI outputs (14,15). The DVI outputs can also display analog XGA outputs through a DVI-I to VGA adapter. These are separate outputs and can be used together or independently.

Additionally, there are two Remote outputs (17,18) which can be used to control documentation equipment. For more information about connecting the camera to video peripherals, refer to the *INTERCONNECT* section in this manual.

There is also one interface connection (23) for the Hermes Operating Room Control Center. For more information about using the Hermes System refer to the Hermes Operating Room Control Center Operating Manual.

REMOTE ACCESSORY CONTROL

The camera supports two remote outputs (17,18) for controlling a Stryker SDC Pro, VCR, or other video accessory. The camera head button can activate one or two peripherals.

In order to use the remote outputs to interface with different peripherals, two six-foot cables with 3.5mm diameter ends, one six foot cable with a 2.5mm and a 3.5mm diameter end and two 2.5mm-to-3.5mm adapters have been provided.

Please refer to the *Interconnect* section in this manual.

LIGHT/ZOOM

The camera control unit has the ability to change the function of the arrow buttons on the camera head. To activate the zoom feature from the arrow buttons, place the LIGHT/ZOOM switch (8) in the ZOOM position. To activate the light level feature from the arrow buttons, place this switch in the LIGHT position.

BUTTON FUNCTION

Place the BUTTON FUNCTION switch (9) ON to activate the short pulse function (either zoom or gain) of the right ('W') button on the camera head. Place this switch OFF to deactivate the short pulse functions of the right camera head button.

FLEX FILTER

The FLEX FILTER can be used to reduce the grid pattern caused by a flexible scope (picture may blur). The Flex Filter status can be toggled by changing the position of the Flex Filter switch (10) or by pressing *both* enhancement buttons (5) for at least one second. Graphics will indicate if the Flex Filter is ON. Ensure the Flex Filter is OFF when using rigid scopes.

AG FILTER

Position the AG FILTER switch (11) ON to reduce the glistening or bright points of light caused by moisture reflection. Position this switch OFF to deactivate the anti-glistening (AG) filter.

SHUTTER SWITCH

Position the SHUTTER switch (12) ON/OFF to activate/ deactivate the automatic shutter.

ON: The camera automatically adjusts the brightness of the video picture in response to varying light levels without using an automatic light source.

OFF: The camera does not adjust to varying light levels. You must use an automatic light source to adjust picture brightness.

NOTE You may use an automatic light source and the camera auto shutter at the same time, but the camera auto shutter should normally be used alone.

CAMERA HEAD BUTTONS

Figure 5

As shown in Figure 5, the camera head contains a diamond-shaped, four-button pad, labeled '↑' to the north, 'P' to the west, 'W' to the east, and '↓' to the south. These buttons provide for remote control of numerous functions. Appropriate audible feedback will accompany the various functions.

'P' BUTTON

The 'P' button controls up to two remote outputs. When depressed less than one second, the button will activate Remote 1.

When depressed longer than one second, the button will activate Remote 2.

'W' BUTTON

The 'W' button activates several different functions, which are selectable through external switches on the front and rear panel.

(1) Depressing this button for more than one second will activate the white balance function.
(2) If AUTO FOCUS is ON, depressing this button for less than one second will establish a baseline for the automatic focus.
(3) If AUTO FOCUS is OFF:
    (a) LIGHT/ZOOM switch to ZOOM – depressing this button for less than one second will raise the gain setting in four increments: 0dB, 5dB, 10dB and 15dB. When the gain setting reaches 15dB, the next short push will cycle the setting back to 0dB.
    (b) LIGHT/ZOOM switch to LIGHT – depressing this button for less than one second will expand the magnification setting in four increments from 1.0 to 1.5. When the magnification setting reaches 1.5, the next short push will cycle the setting back to 1.0.
(4) The above short pulse functions may be disabled by placing the BUTTON FUNCTION switch in the OFF position.

'↑' AND '↓' BUTTONS

The '↑' and '↓' buttons work together to increase or decrease the light level or zoom settings.

ZOOM: With the LIGHT/ZOOM switch in the ZOOM position, the arrow buttons will raise or lower the magnification setting between 1.0 and 1.5 in 44 steps. Press the button once for individual steps or hold down the button for a quicker, smoother transition.

LIGHT LEVEL: With the LIGHT/ZOOM switch in the LIGHT position, the arrow buttons will raise or lower the automatic shutter light level setting in 64 steps. Press the button once for individual steps or hold down the button for a quicker, smoother transition.

Sterility of the camera head may be achieved by use of sterile drapes, ethylene oxide gas, the Steris® system and Sterrad™.

WARNING *Camera head, coupler and camera cable must be cleaned and sterilized prior to first and every subsequent use.*

CAUTION The following procedures do not guarantee sterilization or disinfection. Sterility or disinfection can only be achieved if properly trained personnel follow these recommended procedures and hospital practices.

NOTE Soaking the coupler (adapter) separate from the camera head is not recommended. Moisture may get trapped between the coupler and camera head and cause fogging.

CLEANING

1. Immediately after use, unplug the camera head connector and protect it with the soaking cap. Place the cap over the connector and turn clockwise until secure.

CAUTION Install the soaking cap before rinsing camera to prevent corrosion of the connector pins. Ensure cap is properly tightened.

2. Rinse the camera head and camera head cable in lukewarm tap water. Use mild enzymatic detergent and a soft brush to remove resistant debris. Ensure removal of bioburden from all surfaces.

3. Thoroughly rinse off all soap residue with water.

4. Apply alcohol to glass surfaces with soft cotton applicator to aid in cleaning and drying without leaving spots or streaks.

5. Dry thoroughly with soft towel or gauze surgical sponge.

6. Before disinfection or sterilization, coil the camera head cable into a loop about ten inches in diameter, avoiding kinks and twists in the cable. During disinfection or sterilization, ensure that the camera head and cable are not placed on top of other pieces of equipment.

If the camera control unit needs to be cleaned, wipe it down with a damp cloth or sponge and towel dry.

DISINFECTION WITH GLUTARALDEHYDE SOLUTION

NOTE Never soak the camera head in the same tray with scalpels or other sharp instruments. Avoid soaking dissimilar metals in close proximity in order to minimize galvanic corrosion. Camera malfunction caused by damaged cables is not covered by your warranty.

CAUTION Before soaking, inspect the camera head cable for breaks or cuts. A break or cut in the cable will allow the solution to seep into the camera head and cause damage. Please return any camera with a damaged cable to Stryker Endoscopy Repair Department.

1. Clean and prepare as recommended in the *Cleaning* section. Ensure the soaking cap is installed.

2. Camera head, adapter, and camera head cable should be immersed in Cidex Plus® glutaraldehyde solution or Cidex OPA® solution for disinfecting. Specifications for each is as follows:

   Cidex Plus® disinfection:

soak time:	minimum of ten minutes as recommended by the sterilant manufacturer.
temperature:	25° C (77°F)

   Cidex OPA® disinfection:

soak time:	minimum of 12 minutes as recommended by the sterilant manufacturer.
temperature:	20°C (68°F)

3. After soaking, the camera head, coupler, and cable must be rinsed with sterile water and thoroughly agitated to remove all traces of glutaraldehyde solution. Before use, dry thoroughly with a sterile towel. Ensure the soaking cap and connector are completely dry before removing the cap.

STERILIZATION AND DISINFECTION

STERILIZATION:

100% ETHYLENE OXIDE GAS:

1. Clean and prepare as recommended on page 7. Ensure the soaking cap is installed.

2. Sterility has been validated using an ethylene oxide sterilization unit for a cycle with the following parameters:

temperature:	55°C
humidity:	70% RH±5%
vacuum:	21 in Hg
preconditioning time:	60 minutes
sterilant mixture:	100% ethylene oxide
sterilant concentration:	600±5 mg/L ethylene oxide
exposure time:	120 minutes
aeration:	12 hours, 55°C

STERIS® SYSTEM:

1. Clean and prepare as recommended on page 7. Ensure the soaking cap is installed.

2. Sterility has been validated using Steris® System 1 with Steris® Sterilant 20.

STERRAD™ SYSTEM:

1. Clean and prepare as recommended on page 7. Ensure the soaking cap is installed.

2. Sterility has been validated using Sterrad™ Sterilization System.

NOTE To increase the longevity of the camera head, observe the following process limits:

maximum ethylene oxide exposure time:	3 hours
maximum temperature:	60°C (140°F)
maximum Cidex® Glutaraldahyde soak time:	24 hours

NOTE If coupler and camera head are sterilized or disinfected as a single unit, disconnecting the coupler will compromise the sterility or disinfection.

USE OF STERILE DRAPES

Use of sterile drapes will ensure maximum longevity of your Stryker Endoscopy Model 988 Medical Video Camera. Follow instructions provided by drape manufacturer when using sterile drapes. Sterile camera drapes for use with the Model 988 Medical Video Camera can be ordered under Stryker product number 240-010-200.

CAUTION Maximum performance and camera life is extended by the consistent use of a single sterilization method. Also, avoid leaving the camera in the sterilization solutions longer than necessary as this will accelerate normal product aging.

DISPOSITION OF THE PRODUCT

The device must be disposed of according to local laws and hospital practices. The device does not contain any hazardous materials.

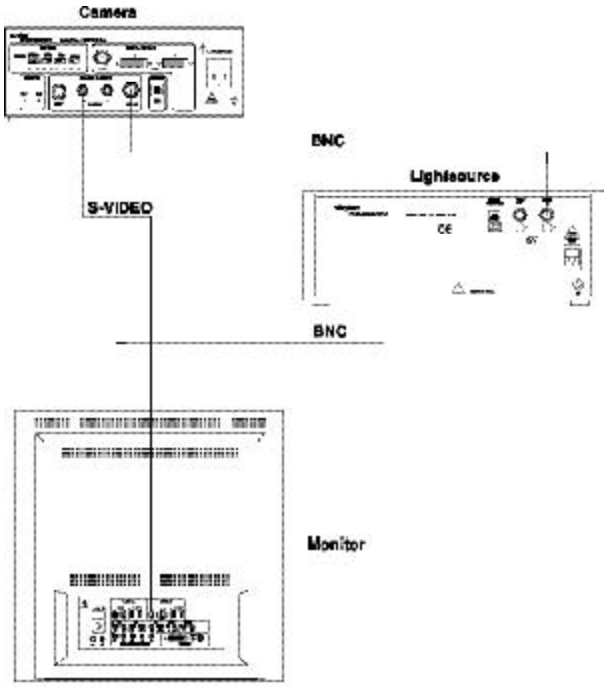
Two types of cables are used in wiring the 988 Video Output:

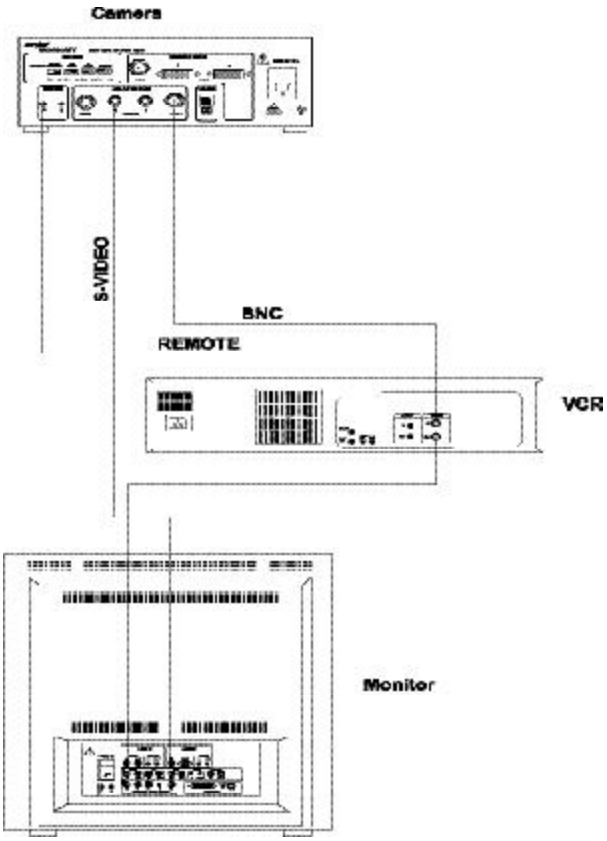
- NTSC cables which have a BNC connector
- S-VHS cables which have a 4 pin Mini-Din connector

BNC connectors are push and turn type connectors while S-VHS cables are push only type connectors. On some monitors, S-VHS inputs may be labeled Y/C, S-VHS and describe the same input. Described in this section are three typical set-ups. Match your equipment and wire them according to the appropriate diagram.

NOTES:

- If you are using a non-Stryker light source with an unterminated input, you must connect a NTSC cable from the VIDEO OUT of the light source to the VIDEO IN on the monitor.
- An additional monitor may be connected using any open camera output.
- You may also connect an S-VHS or BNC cable between the camera and monitor and select the appropriate video source.



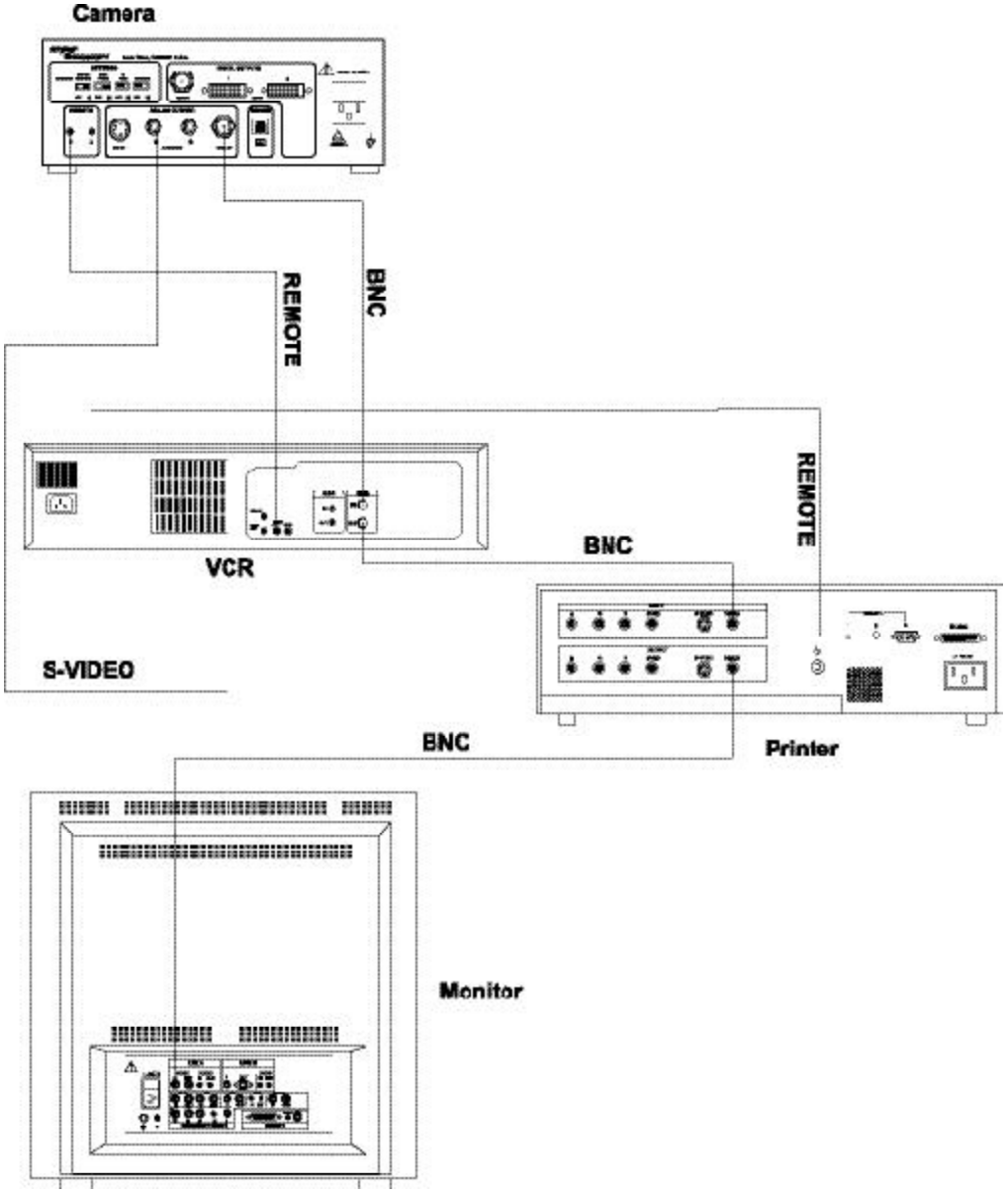


SYSTEM 1

Equipment Used: Camera, Light Source and Monitor

SYSTEM 2

Equipment Used: Camera, Light Source, Video Peripheral and Monitor. The video peripheral may be a video printer, digital capture, Hermes or VCR.



SYSTEM 3

Equipment Used: Camera, Light Source, Stryker Printer, Stryker VCR, Monitor.

PROBLEM	SOLUTION
NO COLOR BAR	• Ensure video out from camera is connected to the video monitor and all video systems are powered on
PICTURE COLOR INCORRECT	• White balance against clean white surface, see WHITE BALANCE section • Check color settings on monitor
PICTURE TOO DARK	• Adjust light source for higher output • Check fiber optic light cable for excessive broken fibers • Press GAIN switch to increase illumination • Set auto SHUTTER to OFF
PICTURE TOO BRIGHT	• Adjust light source for lower output • Select auto SHUTTER mode • Ensure GAIN is OFF
NOISE OR SNOW ON PICTURE (no electro-cautery)	• Ensure GAIN is OFF • Reduce Enhancement • Select auto SHUTTER mode to OFF • Check and replace faulty video cables
NOISE OR SNOW ON PICTURE WHEN USING ELECTRO-CAUTERY	• Plug electro-cautery into separate electrical outlet and separate power cords • Separate camera cable and electro-cautery cable • Reposition electro-cautery grounding pad on patient
NO VIDEO PICTURE WHEN CAMERA HEAD IS PLUGGED IN	• Check to ensure that all components in the video systems are plugged in and power is on • Check connector on camera head cable for broken pins
IMAGE NOT CENTERED	• Release scope from the coupler and re-connect. Make sure the scope is seated correctly in the coupler.
VARIABILITY IN COLOR REPRODUCTION WITH VARIOUS LIGHT SOURCES OR PERIPHERALS	• WHITE BALANCE the camera • Check settings on video peripherals • Ensure light source has proper infrared filter (check with manufacturer specifications)
FOGGY PICTURE (loss of definition & clarity)	• Check camera focus and refocus • Optics are dirty. Clean and dry both the scope and the coupler glass face. • Moisture may exist between the camera head and the coupler. Remove coupler from the camera head and clean this area thoroughly.
CLEANING DIRTY OPTICS	• Rotate the scope. If dust particles in the picture rotate, dust is located on the scope itself. Follow manufacturer's instructions for cleaning the eyepiece and negative lens. • If particles do not move when rotating, particles are behind the scope. Remove the scope and clean the window on the front of the coupler with a dry or alcohol tipped cotton swab. • If dust particles lie between the coupler and camera, remove the coupler and clean the window on the coupler and the window on the camera head. • BE SURE entire area is completely dry before reassembling or fogging may result.
BLURRY PICTURE	• Check that coupler is in focus. • Check that the Flex Filter switch is turned off.
NO WHITE BALANCE (WB)	• Picture too dark (see above for troubleshooting) • Picture too bright (see above for troubleshooting) • Color temperature too low - WB with light source connected and use metal halide or xenon lighting (no fluorescent lighting).

NOTE: If this troubleshooting guide does not solve the problems that you are having with your camera, please refer to the *Service and Claims* section in this manual for instructions on obtaining repair service from Stryker Endoscopy.

SPECIFICATIONS

Imaging System	1/3" Interline Transfer, EX view HAD CCD 768 (H) x 494 (V) pixels		
Scanning System	2:1 Interlaced		
Horizontal:	15.734 kHz		
Vertical:	59.94 Hz		
Video Outputs			
Composite:	One NTSC standard 1.0V P-P into 75 Ohms	Digital:	Two Digital Video Interface (DVI) 1024X768 XGA resolution
Connector:	BNC coaxial	Connector:	29-pin DVI-I
Component:	Two S-VHS Y-1.0V P-P C-0.29V P-P	Digital:	One Serial Digital Interface (SDI) SMPTE-259M
Connector:	4-Pin S-VHS	Connector:	BNC Coaxial
Resolution			
Horizontal:	950 lines		
Vertical:	500 lines		
Signal to Noise Ratio	72 dB		
Mounting	Endoscope Eyepiece used with coupler C-mount camera head used with C-mount scopes (C-mount 1"-32UN-2A)		
Minimum Illumination	< 1.0 Lux		
Auto Shutter Range	1/60 to 1/50,000 second		
Gain			
OFF	0 dB		
LOW	5 dB		
MEDIUM	10 dB		
HIGH	15 dB		
Operating Temperature	5° to 40°		
Transport & Storage			
Temperature	5° to 40° C		
Relative Humidity	10% to 85%		
Atmospheric Pressure	700 hPa to 1060 hPa		
Power Consumption	approx. 30 W		
Input Voltage Range	100/120 VAC 50/60 Hz		
Total Shipping Weight	13 lbs (5.9 kg)		
Dimensions			
Camera Control Unit:	9.8"w x 4.0"h x 15"d (24.8cm w X 10.1cm h X 38.1cm d)		
Camera Head Cable to Camera Control Unit:	10 foot (3m) sealed cable or 21.3 foot (6.5m) sealed cable (sensed by CCU)		
Enhancement	Switchable to 8 steps		
Classification & Approvals	Complies with IEC 601-1 with Amendments 1 & 2, CSA Std. c22.2 No. 601.1 - M90, and UL Std. No. 2601-1 Complies with EN 60601-1-2: 1993 (EMC compliance of medical devices) Type BF applied part or Type CF applied part as labeled on the product Class I equipment Ordinary equipment Continuous operation		

FUSE REPLACEMENT INSTRUCTIONS

1. Unplug the camera control unit from the wall socket and remove the power cord from the camera control unit.

2. Unlatch the fuse holder above the AC Inlet (16) and remove. You may need to press the tab on the fuse holder with a slender screwdriver to release the latch.

3. Replace the fuse with the same value and rating.

WARNING *To avoid the risk of fire, replace only with a fuse of the value specified on the fuse label (located on the rear panel of the camera control unit).*

4. Reinstall the fuse holder until the tab snaps in place.

PERIODIC MAINTENANCE SCHEDULE

WARNING *To ensure safe operation of the Model 988 Medical Video Camera you should perform the following procedure periodically:*

Activity: Check earth leakage current to <500µA (<300µA in U.S.A.), ground impedance to <0.1 ohms, and power consumption less than or equal to rated power.

When: Every 12 months.

Tools and Equipment Required:
True RMS digital multimeter and safety analyzer.

Refer calibration and operating difficulties not detailed in this manual to your Stryker Endoscopy sales representative, or Stryker Endoscopy Customer Service (in the United States: **1-800-624-4422**), or the nearest Stryker Endoscopy subsidiary (refer to the *Other Service* section in this manual).

SERVICE

If service is needed either during or after the warranty period:

1. Contact Stryker Endoscopy at 1-800-624-4422 or phone your local Stryker Endoscopy sales representative.

2. Package all the components carefully in the original shipping container if possible.

3. Ship the camera, pre-paid and insured to:

   Stryker Endoscopy Customer Service
   Attention: Repair Department
   5900 Optical Court
   San Jose, CA 95138

NOTE Never open the camera head or its cable. These units have been factory sealed to prevent moisture from entering the electronic components. If the camera head or the cable seal is intentionally broken, the equipment warranty will be void.

NOTE The medical video camera described in this manual is constantly being reviewed and improvements may be made without notice.

Stryker and Stryker Endoscopy are registered trademarks of Stryker Corporation.

WARRANTY

Stryker Endoscopy warrants the Model 988 Medical Video Camera against defects in both materials and workmanship to the registered owner at the time of purchase. All components including the charge coupled device (CCD) located in the camera head are covered by the warranty for a period of one year from the date of purchase.

This warranty does not apply to any unit which has been subject to misuse, neglect, improper installation or that which has been altered, adjusted, or tampered with by any person other than Stryker Endoscopy authorized personnel.

If upon examination by authorized service personnel, it is determined that the malfunction is due to misuse, or abuse, warranty provisions will not apply. An estimate of the cost of repair work will be given to the customer prior to servicing and repairing the unit.

The customer is responsible for returning the defective equipment to the factory at his or her own expense. Stryker Endoscopy or its representative will service the unit, repair or replace any defective parts thereof, and return the unit.

If, upon examination, it is determined that the fault has been caused by misuse or abnormal conditions of operation, the repairs will be billed to the customer as out-of-warranty repairs.

Instruments repaired under Stryker Endoscopy's standard repair program will be issued a thirty day warranty against defects in both materials and workmanship, provided the original warranty period has passed. Instruments submitted due to defects in materials and workmanship during the warranty period will be repaired at no charge to the customer.

The warranty as set forth herein is exclusive and in lieu of all other warranties, remedies, obligations and liabilities of Stryker Endoscopy Inc., expressed or implied, including the implied warranties of merchantability and fitness for use and of consequential damages. These products are being sold only for the purpose described herein, and such warranty only runs to the purchaser. In no event shall Stryker Endoscopy be liable for any breach of warranty in any amount exceeding the purchase price of the product.

No agent, employee or representative of Stryker Endoscopy has the authority to bind the Company to any other warranty, affirmation, or representation concerning this instrument.

This warranty is valid only to the original purchaser of Stryker Endoscopy products directly from Stryker Endoscopy or from a Stryker Endoscopy authorized agent. The warranty cannot be transferred or assigned by the original purchaser.

OTHER SERVICE

For service in the U.S.A., call your Stryker Endoscopy representative or Stryker Endoscopy Customer Service at 1-800-624-4422. Outside of the U.S.A., please contact your Stryker Endoscopy distributor at one of the following locations:

Stryker Corporation
2725 Fairfield Road
Kalamazoo, MI 49002
USA
Phone: 1-616-385-2600
Telex: 224464 STRYKER KMZ
Fax: 1-616-385-1996

Stryker Canada
3375 North Service Road
Unit C-9
Burlington, Ontario
L7N 3G2
CANADA
Phone: 905-332-3235
Fax: 905-332-7674

Stryker Deutschland GmbH
Gewerbeallee 18
D-45478 Mulheim an der Ruhr
GERMANY
Phone: 49-208-999060
Fax: 49-208-9990666

Stryker Taiwan
5F-1,23 Pa Te Road
Section 1, Taipei, TAIWAN, R.O.C.
Phone: 886-2-2322-2895
Fax: 886-2-2357-8543

Stryker U.K.
Stryker House, Hambridge Road
Hambridge Road Industrial Estate
Newbury RG14 5EP
United Kingdom
ENGLAND
Phone: 44-1635-262400
Fax: 44-1635-36400

Stryker B.V.
Marinus van Meelweg 17
5657 En Eindhoven
THE NETHERLANDS
Phone: 31-40-2922522
Fax: 31-40-2922555

Stryker France
Z.A.C. Paris-Nord 11
13, Rue de la Perdrix
93290 Tremblay les Gonesse
FRANCE
Phone: 33-1-48175038
Fax: 33-1-48632175

Stryker Korea
11F Dong Sung Bldg. 154-24
Samsung-dong, Kangnam-ku
Seoul
KOREA 135-090
Phone: 82-2-565-7303
Fax: 82-2-552-4156

Stryker Australia
50 Broughton Road
Artarmon NSW 2064
AUSTRALIA
Phone: 61-2-9420-0522
Fax: 61-2-9420-0633

Stryker Pacific Headquarters
Suite 2501, Citibank Tower
Citibank Plaza
3 Garden Road
HONG KONG
Phone: 852-2840-4400
Fax: 852-2804-6303

Stryker Singapore (ASEAN)
70 Bendemeer Road
#03-32 Hiap Huat House
SINGAPORE 339940
Phone: 65-293-0119
Fax: 65-293-7028

Stryker Osteonics, SA
Via della Posta, PO Box 254
6934 Bioggio
SWITZERLAND
Phone: 41-91-610-4410
Fax: 41-91-610-4421

Stryker India
India Office
First Floor C-5
SDA Commercial Complex
New Delhi 110016
INDIA
Phone: 91-11-686-6742
Fax: 91-11-696-6020

Nippon Stryker K.K.
25-3 Yoyogi 3-Chome
Shibuya-ku, Tokyo 151-0053
JAPAN
Phone: 81-03-5352-9211
Fax: 81-03-5352-9204

Stryker China
Room 832 Capital Times Square
No. 88 West Chang An Street
Beijing 100031
P. R. CHINA
Phone: 852-2814-7463
Fax: 852-2873-0210

Stryker Europe Headquarters
Cite-Centre, Grand Rue 92
CH-1820 Montreux
SWITZERLAND
Phone: 41-21-966-1201
Fax: 41-21-966-1200

Stryker Latin America
Plaza Royale Suite 304
15600 NW 67th Ave.
Miami Lakes, Florida 33014
USA
Phone: 1-305-821-1888
Fax: 1-305-826-0067

Stryker Middle East / Africa
1404 Al Masaoud Bldg. Suite 604
Hamdan Street
Abu Dhabi
U.A.E.
Phone: 9712-6312145
Fax: 9712-6313698

Stryker Mexico, S.A. de C.V.
Montecito No. 38
Piso 12, Oficina 31
Colonia Napoles
MEXICO 03810
Phone: 525-488-0890
Fax: 525-488-0891

NV Stryker SA (Belgium)
Ikaros Business Park Fase III
Ikaroslaan 12
1930 Zaventem
BELGIUM
Phone: 32-2-717-92-10
Fax: 32-2-717-92-49

Stryker Chile
Avenida Nueva Tajamer 481
Oficina 805 Piso 8
Torre Norte, Santiago
CHILE
Phone: 562-244-3600
Fax: 562-244-3696

Stryker Spain
Manuel Tovar 35
28034 Madrid
SPAIN
Phone: 34-91-7283500
Fax: 34-91-3580748

Stryker AB Scandinavia
Krossverksgatan 3
2-216 16 Malmö
SWEDEN
Phone: 46 40-69-18-136
Fax: 46 40-69-18-190

Stryker A/S Denmark
Krossverksgatan 3
2-216 16 Malmö
SWEDEN
Phone: 45 3677 9966
Fax: 45 3677 8666

Stryker Finland
PL 80 (Makelankatuz)
FIN 00501 Helsinki
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Fax: +358 (0) 9 7744 6820

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San Jose, CA 95138
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