

PENTAX™

PENTAX VIDEO PROCESSOR

EPK-P

OWNER'S MANUAL



Generic name: Light source processor for endoscopes
Medical equipment requiring controls/designated medical equipment requiring controls

Before Using This Device

INTENDED USE:

This electro-medical device (Video Processor) is intended to be used for endoscopic diagnosis and treatment. Together, this Video Processor and PENTAX video endoscope may provide optical visualization of, and/or therapeutic access to, various body cavities, organs and canals. Do not use this device for any purpose other than that for which it has been designed.

This device should only be used by physicians who have thoroughly studied all the characteristics of this device and who are familiar with the proper techniques of endoscopic examination.

Compatible Endoscope Models

This processor can be used with

- PENTAX color video endoscopes (K-series) except 30K, 40K, 70CIMK/CIFK/CILK (Confocal Endomicroscopes) and 70UK/UTK/URK (Ultrasound Endoscopes) series
- PENTAX fiberscopes with use of PENTAX video adapter module PVK-1070 and PVK-1070Z

IMPORTANT:

Read this manual before operating and save this book for future reference.

This manual describes the recommended procedures for inspecting and preparing the EPK-p Video Processor prior to its use and the care and maintenance after its use. It does not describe how an actual procedure is to be performed, nor does it attempt to teach the beginner the proper technique or any medical aspects regarding the use of the equipment.

Failure to follow the instructions in this manual may result in damage to and/or malfunction of the equipment.

Do not use this device for any other purpose than that for which it has been designed.

If you have any questions regarding any of the information in this manual or concerns pertaining to the safety and/or use of this equipment, please contact your local PENTAX representative.

CAUTION:

Federal (USA) law restricts this device to sale by, or on the order of a physician or other appropriately licensed medical professional.



このCEマーキングはEC指令への適合宣言マークです。

The CE marking assures that this product complies with the requirements of the EC directive for safety. Das CE Zeichen garantiert, daß dieses Produkt die in der EU erforderlichen Sicherheitsbestimmungen erfüllt.

Le logo CE certifie que ce produit est conforme aux normes de sécurité prévues par la Communauté Européenne.

Il marchio CE assicura che questo prodotto è conforme alle direttive CE relative alla sicurezza.

La marca CE asegura que este producto cumple todas las directivas de seguridad de la CE.

CE 标志意味着保证该产品遵从欧洲共同体安全法规。



Symbol for "MANUFACTURER"



Symbol for "DATE OF MANUFACTURE"



Symbol for "AUTHORISED REPRESENTATIVE IN THE EUROPEAN UNION"

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1. SAFETY PRECAUTIONS - IMPORTANT

The following precautions should always be exercised with the use of all electro-medical equipment to ensure safety to all involved parties - user(s), patient(s), etc.

Please carefully read and follow this owner's manual.

1-1. TRAINING

This equipment should only be used under the supervision of a trained physician in a medical facility. Do not use in other locations or for any other purposes than the intended application.

1-2. INSTALLATION

1. This equipment should NEVER be installed or used in areas where the unit could get wet or be exposed to any environmental conditions such as high temperature, humidity, direct sunlight, dust, salt, etc., which could adversely affect the equipment.
2. This equipment should NEVER be installed or used in the presence of flammable or explosive gases or chemicals.
3. This equipment should NEVER be installed, used or transported in an inclined position nor should it be subjected to impact or vibration.
4. For safety reasons, this equipment must be properly grounded. (This equipment should be connected to a three (3) prong hospital grade receptacle in U.S.A. or Canada.)
5. Ensure that all power requirements are met and conform to those specified on the rating plate located on the rear panel.
6. Do not block the air intake vent of this equipment.
7. Do not allow the power cord to become twisted, crushed or pulled taut.
8. When using an isolation transformer for any ancillary equipment, ensure the power requirements of the devices do not exceed the capacity of the isolation transformer. For further information, contact your local PENTAX distributor.

1-3. PRIOR TO USE

1. Confirm that this equipment functions properly and check the operation of all switches, indicators, etc.
2. To prevent electrical shock when used with endoscopes, this equipment is insulated (type BF electro-medical equipment). Do not allow it to be grounded to other electrical devices being used on the patient. Rubber gloves should always be worn to prevent grounding through user(s).
3. Confirm that other devices used in conjunction with this equipment function properly and that these other devices will not adversely affect the operation or safety of this equipment. If any component of the endoscopic system is not properly functioning, the procedure should not be performed.
4. Check and confirm that all cords or cables are connected correctly and securely.
5. The lamp life when used in this equipment is on average 50 hours. Prior to use, check the lamp life indicator on the front panel to ensure the indicator is lit green.

NOTE

The lamp life for the EPK-p processor is rated at 50 hours.

1-4. DURING USE

1. To prevent electric shock, the endoscope and/or any other ancillary device should NEVER be applied directly to the heart.
2. Make sure that no contact is made between the patient and this equipment.
3. To avoid damage to the luminous display and flat membrane switches, do not press any keys with any sharp or pointed objects.
4. The light emitted by the Xenon lamp is extremely intense. Avoid looking directly at the light exiting the endoscope and/or this equipment.
5. To protect the users eyes and avoid risk of thermal injury during an endoscopic examination, use only the minimum amount of brightness required.
6. During clinical procedures, avoid unnecessary prolonged use which could compromise patient/user safety.
7. Continually monitor this equipment and the patient for any signs of irregularities.
8. In the event that some type of irregularity is noted to the patient or this equipment, take the appropriate action to ensure patient safety.
9. If the operation of any of the components of the endoscopic system fails during the procedure and the visualization of the procedure is lost or compromised, place the endoscope in the neutral position and slowly withdraw the endoscope.
10. This equipment should only be used according to the instruction and operating conditions described in this manual. Failure to do so could result in compromised safety, equipment malfunction or instrument damage.

1-5. AFTER USE

1. Refer to the operating instructions supplied with all the components of the endoscopic system to establish the right order in which components should be turned off. Some peripheral devices may have to be turned off first to avoid compromising their operation.
2. Wipe all surfaces with gauze slightly dampened with alcohol.
3. Be sure connector interfaces and ventilation ports are not allowed to become wet or splashed with liquids.

1-6. STORAGE

1. This equipment should NEVER be stored in areas where the unit could get wet or be exposed to any environmental conditions such as high temperature, humidity, direct sunlight, dust, salt, etc., which could adversely affect the equipment.
2. This equipment should NEVER be stored in the presence of flammable or explosive gases or chemicals.
3. This equipment should NEVER be stored or transported in an inclined position, nor should it be subjected to impact or vibration.
4. Cords, accessories, etc., should be cleaned and neatly stored.
5. This equipment should be maintained in a clean condition during storage and be ready for subsequent use.

1-7. SERVICE

1. Alterations/modifications to the equipment should NEVER be made. Repairs should only be performed by an authorized PENTAX service facility.
2. When replacing the lamp, use only the lamp recommended by PENTAX and follow all PENTAX instructions provided.

1-8. MAINTENANCE

1. Periodically this equipment and any applicable accessories should be inspected for operation and safety.

1-9. DISPOSAL

1. The equipment should be returned for disposal to PENTAX.
Contact your local PENTAX representative or service facility.

1-10. FOR THE STATE OF CALIFORNIA, USA ONLY

Perchlorate Material-special handling may apply. See www.dtsc.ca.gov/hazardouswaste/perchlorate.

Perchlorate Material: Lithium battery contains perchlorate.

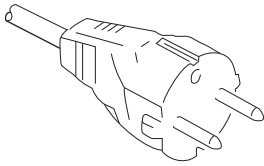


Information on Disposal for users in the European Union

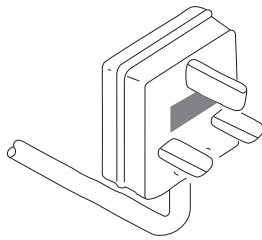
This product is a medical device. In accordance with European Directive 2002/96/EC on Waste Electrical and Electronic Equipment, this symbol indicates that the product must not be disposed of as unsorted waste, but should be collected separately. Contact your local PENTAX distributor for correct disposal and recycling. By disposing of this product correctly, you will help ensure that the waste undergoes necessary treatment, recovery and recycling, thus preventing potential negative effects on the environment and human health which could otherwise arise due to inappropriate waste handling.

POWER REQUIREMENTS

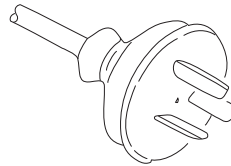
Check the standard power plug configurations that are used in your country. If the appropriate power cord is not included in your product, notify your local PENTAX distributor.



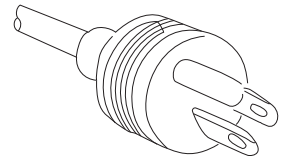
Continental Europe
(Use a SEV approved plug
for Switzerland)



U.K.



Australia and
New Zealand



U.S.A. and Canada
(Hospital Grade)

SYMBOLS ON MARKING



Alternating current



Type BF applied part (Safety degree specified by IEC 60601-1)



OFF (Power: disconnection from mains)



ON (Power: connection to the mains)



Attention, consult Owner's Manual



Protective earth (ground)



Equipotentiality



Waste in Electrical and Electronic Equipment



China RoHS

CONVENTIONS

The following conventions have been established in the text of this manual to aid in the identification of potential hazards of operation;



WARNING

: Could result in death or serious injury.



CAUTION

: May result in minor or moderate injury or property-damage.

NOTE

: May result in property-damage. Also, advises owner/operator about important information on the use of this equipment.

1. PRECAUTIONS DE SECURITE - IMPORTANT

Les précautions suivantes doivent toujours être observées lors de l'utilisation de tout matériel médical électrique susceptible d'être utilisé avec cet appareil, pour assurer à toutes les personnes concernées (utilisateurs, patients, etc...) une sécurité maximale.

Veuillez lire et suivre attentivement les recommandations du manuel d'utilisation.

1-1. FORMATION

L'appareil ne doit être utilisé que sous la surveillance d'un médecin expérimenté, dans un établissement médical. Ne pas utiliser dans un autre endroit ou pour toute autre application pour laquelle il n'est pas prévu.

1-2. INSTALLATION

1. L'appareil ne doit JAMAIS être placé ou utilisé dans un endroit où il serait mouillé ou exposé à l'humidité, à une température élevée, à la lumière solaire directe, à la poussière, au sel, etc., qui pourraient l'endommager.
2. L'appareil ne doit JAMAIS être placé ou utilisé en présence de gaz ou de produits chimiques inflammables ou explosifs.
3. L'appareil ne doit JAMAIS être placé, utilisé ou transporté en position inclinée, ni être soumis à des chocs ou des vibrations.
4. Pour des raisons de sécurité, l'appareil doit être correctement relié à la terre (cet appareil doit être branché dans une prise secteur 3 broches aux normes Hôpital aux U.S.A. et au Canada).
5. Assurez-vous que les spécifications électriques de la prise secteur sont conformes à celles indiquées à l'arrière de l'appareil.
6. Ne pas obturer les orifices de ventilation de l'appareil.
7. Ne pas écraser, plier ou tendre le cordon secteur.
8. Dans le cas où un transformateur d'isolement est utilisé pour le matériel périphérique, vérifier que la puissance totale de l'installation ne dépasse pas la capacité du transformateur. Pour de plus amples informations, contacter votre distributeur PENTAX.

1-3. AVANT UTILISATION

1. Vérifier le fonctionnement de l'appareil et de ses interrupteurs, afficheurs, voyants, etc...
2. Pour prévenir les risques de chocs électriques lorsqu'il est utilisé avec des endoscopes, cet appareil doit être installé comme "Matériel électrique médical type BF". Ne pas le relier aux autres appareils électriques utilisés pour le même patient. Les utilisateurs doivent s'isoler électriquement en portant des gants de caoutchouc.
3. Vérifier le fonctionnement des périphériques utilisés avec l'appareil et s'assurer qu'ils n'en perturbent pas le fonctionnement et la sécurité. Si l'une des composantes du système endoscopique ne fonctionne pas correctement, interrompre l'utilisation.
4. Vérifier le branchement des différents câbles de liaisons (vidéo, secteur, contrôle, etc...).
5. La durée de vie nominale de la lampe est de 50 heures en moyenne. Avant utilisation, vérifier que le témoin de durée de vie vert ou jaune est allumé.

NOTE

La durée de vie de la lampe estimée à 50 heures s'applique au processeur EPK-p.

1-4. PENDANT L'UTILISATION

1. Pour éviter les risques de choc électrique, l'endoscope et/ou tout autre périphérique utilisé conjointement avec l'appareil ne doivent JAMAIS être placés directement sur le cœur.
2. Ne pas mettre le patient en contact avec l'appareil.
3. Pour conserver l'afficheur et le clavier souple en bon état, ne pas presser les touches du tableau avec un objet pointu ou tranchant.
4. Éviter de regarder directement la lumière sortant de l'endoscope et/ou de l'appareil du fait de la forte luminosité émise par la lampe Xénon.
5. Pour protéger l'utilisateur et éviter toute blessure thermique pendant l'examen, régler la luminosité au minimum nécessaire.
6. Éviter une utilisation prolongée de l'appareil si elle n'est pas indispensable, pour ne pas compromettre la sécurité du patient et de l'utilisateur.
7. Surveiller en permanence l'appareil et le patient pour prévenir tout signe de dysfonctionnement.
8. En cas de problème avec le patient ou l'appareil, prendre toutes les mesures nécessaires pour préserver la sécurité du patient.
9. Si un problème de fonctionnement survient sur l'un des appareils du système endoscopique et que l'image est interrompue ou altérée, placer l'endoscope en position neutre et le retirer doucement.
10. Cet appareil doit toujours être utilisé selon les instructions et conditions de fonctionnement décrites dans ce manuel. Ne pas les suivre peut compromettre la sécurité, le fonctionnement du matériel, ou endommager l'appareil.

1-5. APRES UTILISATION

1. Veuillez vous référer aux instructions fournies avec chaque composante du système endoscopique afin d'éteindre les composantes dans l'ordre adéquat. Certains périphériques peuvent devoir être éteints d'abord pour ne pas compromettre leur fonctionnement.
2. Essuyer les appareils avec une compresse légèrement imbibée d'alcool.
3. Vérifier que les connecteurs et les orifices de ventilation sont à l'abri des projections de liquides.

1-6. STOCKAGE

1. L'appareil ne doit JAMAIS être rangé à l'humidité, à température élevée, à la lumière solaire directe, la poussière, au sel, etc., qui pourraient l'endommager.
2. L'appareil ne doit JAMAIS être rangé en présence de gaz ou de produits chimiques explosifs.
3. L'appareil ne doit JAMAIS être rangé en position inclinée ni être soumise à des chocs ou des vibrations.
4. Les accessoires et les câbles doivent être nettoyés et rangés correctement.
5. L'appareil doit être maintenu en parfait état de propreté durant le stockage, et tenu prêt pour l'utilisation suivante.

1-7. SERVICE

1. Ne JAMAIS modifier ou altérer l'appareil. Les réparations éventuelles ne doivent être effectuées que par un service après-vente agréé PENTAX.
2. Le remplacement de la lampe ne doit être effectué que par une lampe agréée par PENTAX et en suivant les instructions fournies par PENTAX.

1-8. MAINTENANCE

1. Périodiquement, cet appareil et tous les périphériques associés doivent être vérifiés en fonctionnement et en sécurité.

1-9. ÉLIMINATION

1. Ce matériel doit être retourné à PENTAX pour élimination.
Contacter votre représentant ou votre service après-vente PENTAX local.

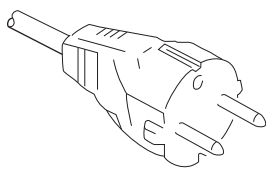


Information concernant l'élimination des produits dans l'Union européenne

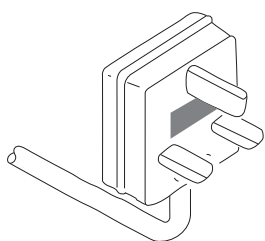
Ce produit est un dispositif médical. En conformité avec la Directive européenne 2002/96/CE relative aux déchets d'équipements électriques et électroniques, ce symbole indique que le produit ne doit pas être éliminé comme un déchet non trié, mais qu'il doit faire l'objet d'une collecte sélective. Contactez votre distributeur PENTAX local pour avoir des informations concernant la procédure correcte d'élimination et de recyclage. En éliminant ce produit correctement, vous contribuerez à garantir que ce déchet est soumis au traitement, à la valorisation et au recyclage nécessaires, empêchant ainsi les effets négatifs potentiels pour l'environnement et la santé des personnes qui résultent de la gestion inappropriée des déchets.

ALIMENTATION NECESSAIRE

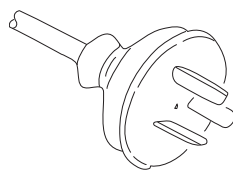
Vérifiez le type de prise de courant utilisé dans votre pays. Si le cordon secteur approprié n'est pas fourni avec votre appareil, contactez votre distributeur PENTAX.



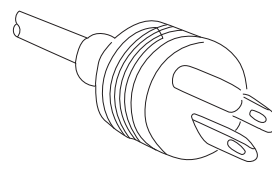
Europe Continentale
(Utiliser une fiche homologuée
SEV pour la Suisse)



Royaume - Uni



Australie et Nouvelle Zélande



USA et Canada
(Normes Hôpital)

SYMBOLES UTILISES



Courant alternatif



Élément type BF (Niveau de sécurité spécifié par la norme IEC60 601-1)



“OFF” (Alimentation : déconnectée du secteur)



“ON” (Alimentation : connectée au secteur)



Attention : consulter le manuel d'utilisation



Mise à la terre de protection



Equipotentialité



Déchets d'équipements électriques et électroniques



RoHS Chine

CONVENTIONS

Les conventions suivantes ont été adoptées dans le texte de ce manuel, afin d'aider à l'identification des risques potentiels liés à l'utilisation;



WARNING

: Peut causer la mort ou une blessure grave.



CAUTION

: Peut causer une blessure légère à modérée ou des dégâts au matériel.

NOTE

: Peut causer des dégâts au matériel. Donne aussi à l'utilisateur des informations sur les appareils.

Front Panel

1

Exposure Control Switch EXPOSURE CONTROL

Use this switch to change the method of adjusting the screen brightness.

AUTO: Adjust the screen brightness automatically.

MANUAL: Adjust the screen brightness manually.

"Exposure Control Switch" (P.26)

Lamp Switch LAMP

Use this switch to turn the lamp on or off.

"Lamp Switch" (P.25)

Lamp Life Indicator

An indicator lights green when the lamp can be used. If a lamp goes out, the indicator lights orange. Replace the lamp.

"Replacing the Lamp" (P.44)

Measuring Method Switch METERING MODE

Use this switch to change the measuring method if you selected [AUTO] with EXPOSURE CONTROL.

AVE: Measure based on the average brightness value for the whole screen.

PEAK: Measure based on the maximum brightness value for the screen.

"Measuring Method Switch" (P.26)

Adjustment Switches

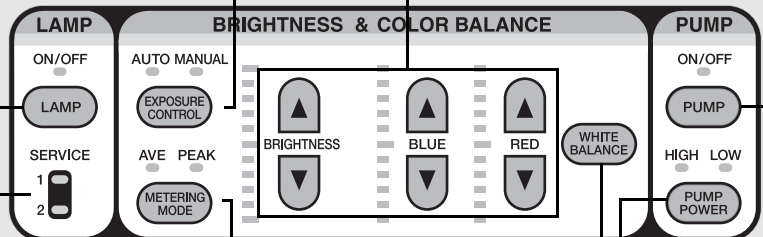
If you adjust the brightness and the red and blue color tone levels of the screen with , the levels are indicated by the indicators.

BRIGHTNESS: Adjust the brightness of the screen.

RED: Adjust the red color tone of the screen.

BLUE: Adjust the blue color tone of the screen.

"Adjustment Switches" (P.27)



Pump Switch PUMP

Use this switch to turn the pump on or off.

"Pump Switch" (P.26)

Pump Power Switch PUMP POWER

Use this switch to set the strength of the air and water supply of the pump.

"Pump Power Switch" (P.26)

White Balance Switch WHITE BALANCE

Adjust the white balance.

"White Balance Switch" (P.27)

CAUTION

The lamp life for the EPK-p processor is 50 hours. Check the service lamp life indicator on the front panel before you use the processor. When the lamp needs to be replaced, the service light will illuminate in orange for either service light 1 or 2 and "Please replace lamp (1 or2)" appears on the monitor. Check the service light and correctly identify which lamp needs to be replaced and replace the appropriate lamp with a new one.

"Replacing the Lamp" (P.44)

Rear Panel

1

RGB OUTPUT (Video out)

This connector is for outputting video signals (RGB color signals and synchronous signals) to send to a monitor or image processor.


REMOTE

These connectors are for when you want to remotely operate peripheral devices.

SERIAL

This connector is for outputting the digital data of still images.

Fuse Box

This fuse box contains 2 fuses.  "Replacing the Fuses" (P.46)

Y/C OUTPUT

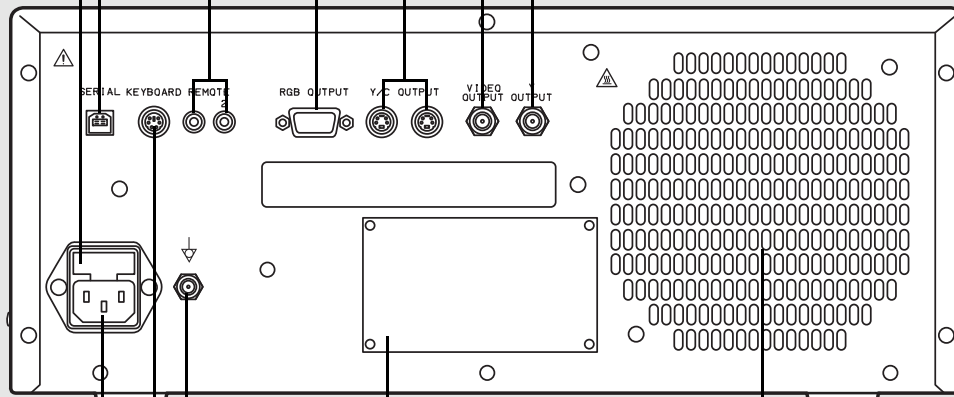
These connectors (separated video outputs) are for outputting separate video signals (video signals separated into luminance signals and color signals) to send to a monitor or image processor.

VIDEO OUTPUT

This connector is for outputting composite video signals (BNC connectors) to send to a monitor or image processor.

Y OUTPUT

This connector (BNC connector) is for outputting black and white video signals.



Power Input Socket

Insert the AC power cord.

Rating Plate

This plate shows the processor rating specifications, acquired standards, etc.

Potential Equalization Terminal

This terminal is used with a potential equalization busbar to equalize the potential of other equipment connected to the processor.

KEYBOARD

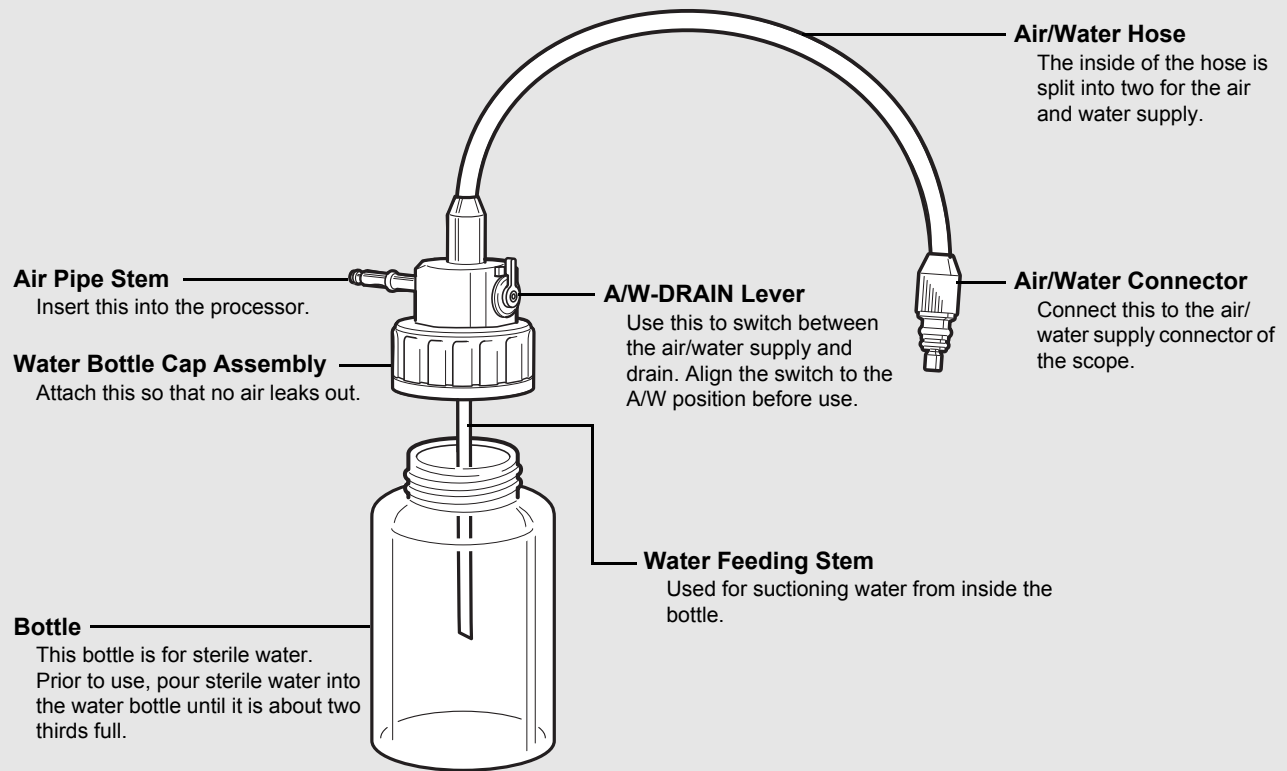
This connector is for connecting a keyboard. You can connect a general purpose keyboard (US layout).

Ventilation Grid

Note

Install the processor in a location where the ventilation grid will not be blocked.

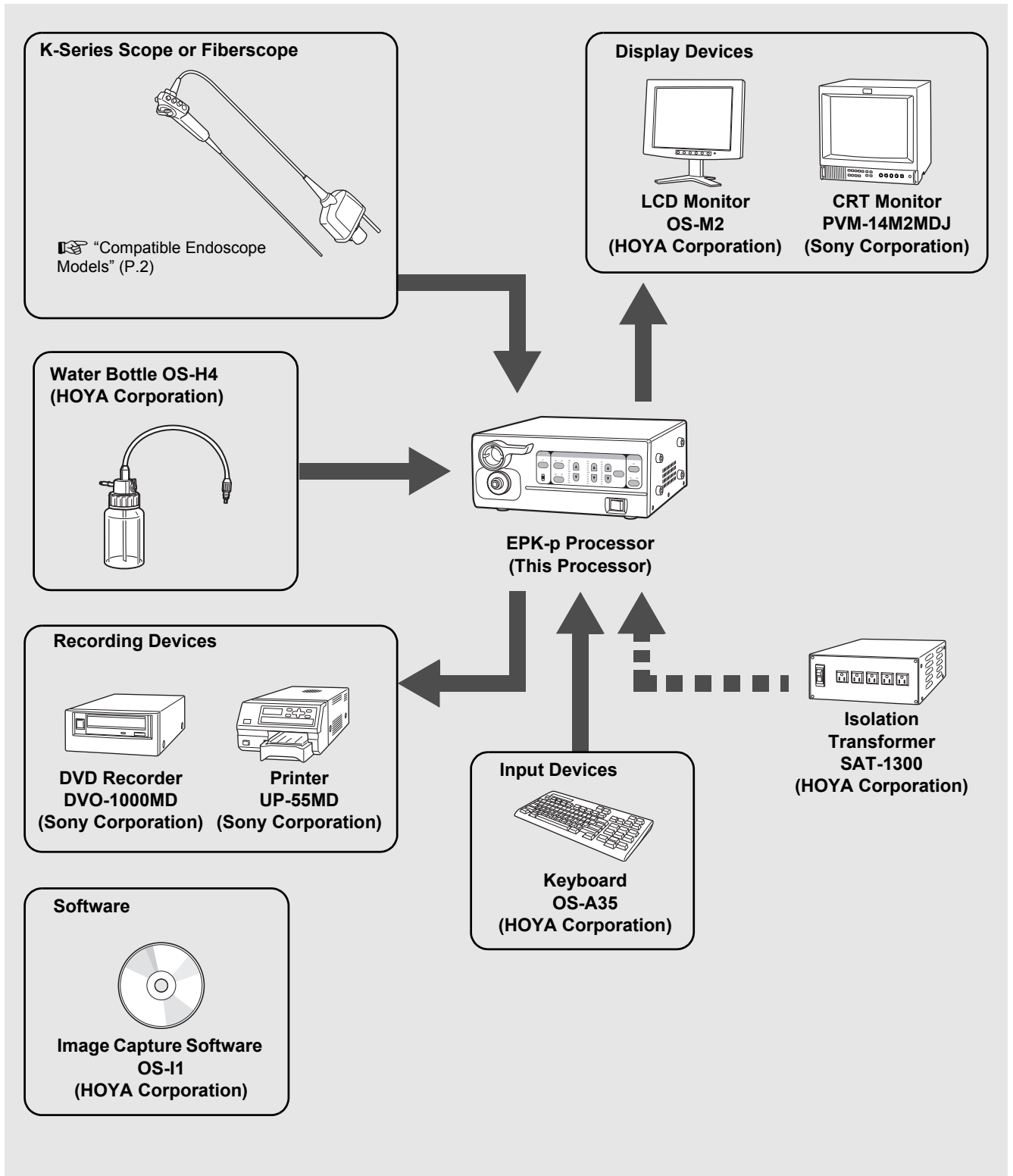
Water Bottle (OS-H4)



1

System Configuration

The following shows an example of a system configuration for using the processor.



Installation

Install the processor and peripheral devices while referring to “System Configuration” (P.14). Install them on a stable and level surface.

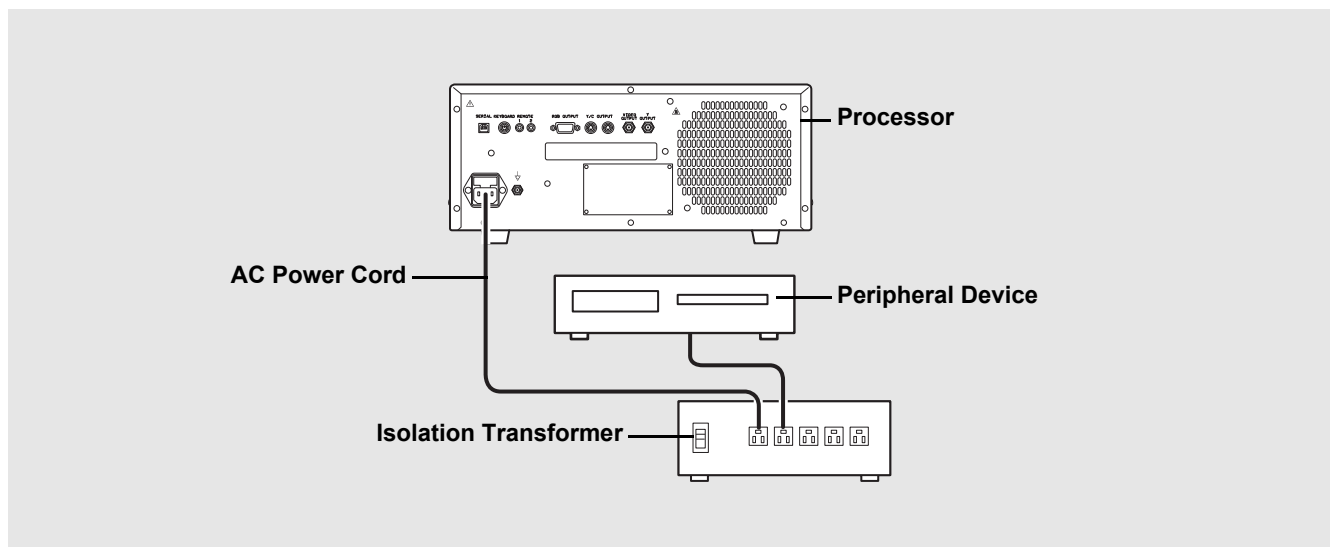
CAUTION

- Do not install the processor in any of the following locations.
 - Where the processor is likely to be exposed to water.
 - Where flammable or explosive gas is present.
 - In very hot and humid locations.
 - Where the processor will be exposed to direct sunlight.
- Do not install the processor vertically. Doing so may cause a malfunction or water to leak.
- Install the processor in a location where the ventilation grids will not be blocked.
- Install the processor in a location where dust will not enter inside. Wipe off any dust on the processor. Excessive amounts of dust accumulating inside the unit may cause the processor to malfunction, emit smoke, or catch fire.
- Do not hold the scope locking lever when you move the processor.

2

Connecting an Isolation Transformer

Connect the processor and peripheral devices to an isolation transformer. To reduce the possibility of electric shock connect the video processor and peripheral devices to the PENTAX SAT-1300 Isolation Transformer or another Medical Grade Isolation Transformer of the appropriate power rating.



- 1** Connect the power cord of the isolation transformer to a three-prong power outlet that meets the power rating indicated on the rating plate.
- 2** Use the AC power cord to connect the power input socket on the rear panel of the processor to the isolation transformer.
 - Make sure the processor is turned off beforehand.
- 3** Connect the peripheral devices to the isolation transformer.
 - Make sure the peripheral devices are turned off prior to installation.
 - For details on peripheral devices, refer to the instruction manuals for the peripheral devices.

CAUTION

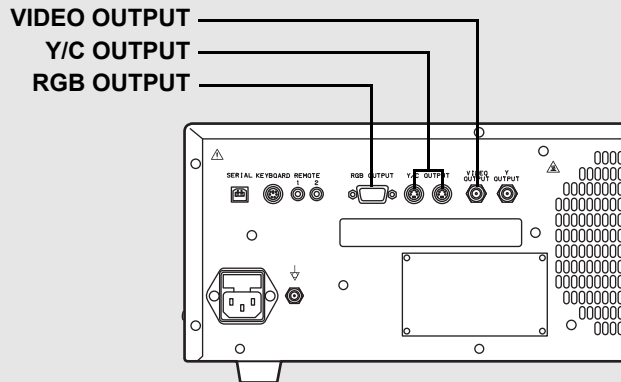
- Do not connect any electrical devices other than the processor and peripheral devices of the processor to the isolation transformer.
- Make sure the voltage, current, and power consumption of the processor and peripheral devices do not exceed the maximum ratings indicated on the isolation transformer.
- Be sure to securely connect the power cord of the isolation transformer to a three-prong power outlet.

■ Connecting Peripheral Devices

Connect peripheral devices to the processor. Make sure the processor and peripheral devices are turned off beforehand.

● Connecting a Monitor

Connect a monitor to the processor. For details, refer to the instruction manual for the monitor.



Connecting a monitor with a composite video input

Use a BNC video cable (OS-A17) to connect the VIDEO OUTPUT to the composite video input of the monitor.

Connecting a monitor with an RGBS video input (BNC)

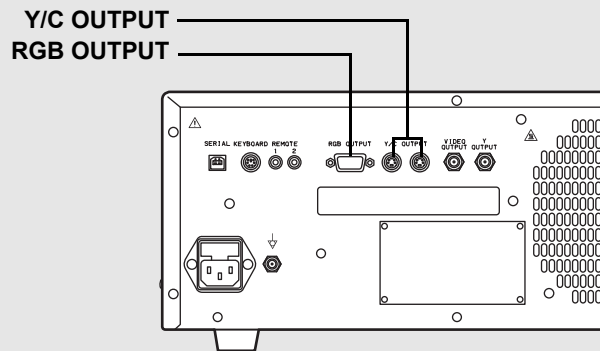
Use an RGB cable (OS-A25) to connect the RGB OUTPUT to the RGBS video input (BNC) of the monitor.

Connecting a monitor with a 4-pin female mini-DIN connector

Use a Y/C cable (OS-A24) to connect the Y/C OUTPUT to the 4-pin female mini-DIN connector of the monitor.

● Connecting a Printer

Connect a printer to the processor. For details, refer to the instruction manual for the printer.



For RGB output method

Use an RGB cable (OS-A25) to connect the RGB OUTPUT to the connector of the printer.

For Y/C output method

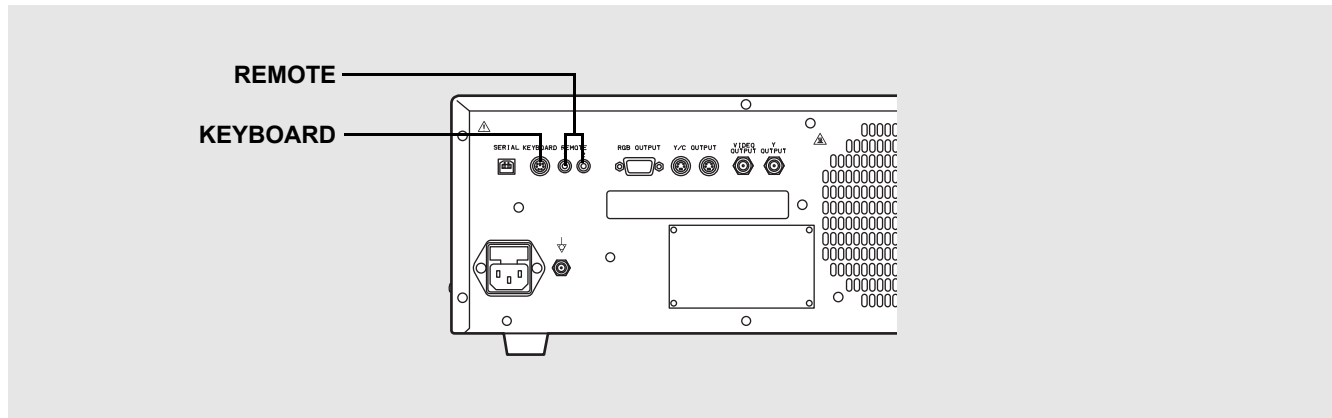
Use a Y/C cable (OS-A24) to connect the Y/C OUTPUT to the connector of the printer.

NOTE

The BNC cable (OS-A17) and Y/C cable (OS-A25) are sold separately.

● Connecting a Keyboard and Remote Control

For details, refer to the corresponding instruction manuals.



2

Connecting a keyboard

Connect a general-purpose keyboard (US layout) to the KEYBOARD connector.

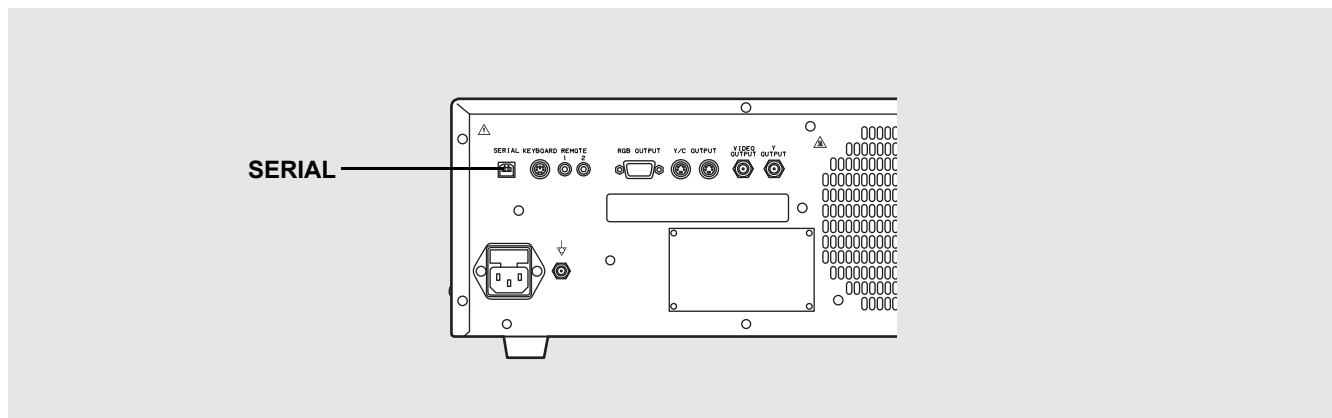
- You can also connect a keyboard (OS-A35: sold separately) supplied by PENTAX.

Connecting a remote control

When you want to use a peripheral device that includes support for remote (trigger) input, use a control cable (OS-A58) to connect the remote connector of the peripheral device to REMOTE. For details on the peripheral device, refer to the instruction manual for the peripheral device.

● Connecting a PC

Connect a PC with Image Capture Software (OS-I1) installed to the processor. For details, contact our service personnel.



Connecting a PC

Connect the serial interface of the PC to the SERIAL port.

NOTE

The control cable (OS-A58) and Image Capture Software (OS-I1) are sold separately.

Connecting an Endoscope

Connect a scope to the processor. Use a scope with a water bottle and suction unit connected to the scope. You can connect a PENTAX K-series video endoscope (P.50) to the processor. For details on the scope, refer to the owner's manual for the scope.

- 1** Align the scope locking lever of the processor to the OPEN position. (Refer to Figure 2.1)
- 2** Insert the electrical connector and light guide of the scope into the corresponding scope electrical connector and light guide attachment of the processor and move the scope locking lever in the direction of ② until it clicks into the LOCK position.

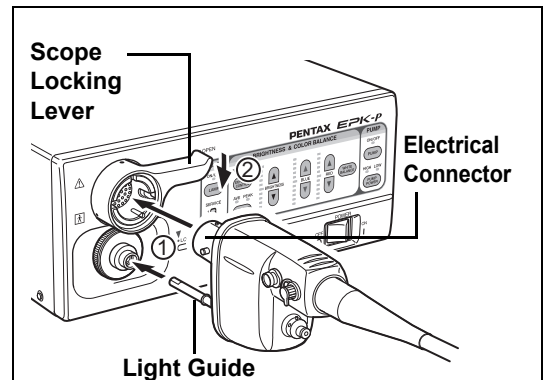


Figure 2.1

- 3** Attach water bottle assembly, 2/3 filled with sterile water, to the appropriate location on the left side of the video processor.

NOTE

- Do not over tighten the cap.
 - Replace the sterile water every day.
 - Be sure to use sterile water.
-
- Align the A/W-DRAIN lever to the A/W (air/water supply) position. (Refer to Figure 2.2)

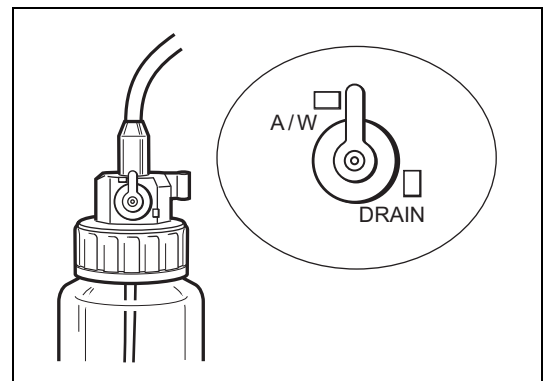


Figure 2.2

- Insert the air/water connector into the holder of the cap until the scope is connected. (Refer to Figure 2.3)

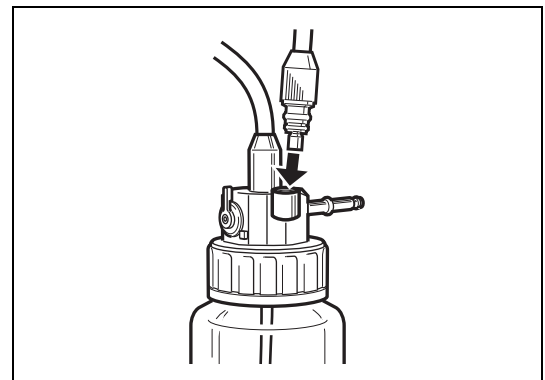


Figure 2.3

- 4** Insert the air pipe stem of the water bottle into the water bottle receptacle of the processor until it clicks into place. (Refer to Figure 2.4)

NOTE

- The use of excessive force may cause the processor or the water bottle to leak water inside the processor. Remove the water bottle before moving the processor or before packing the processor for shipment.

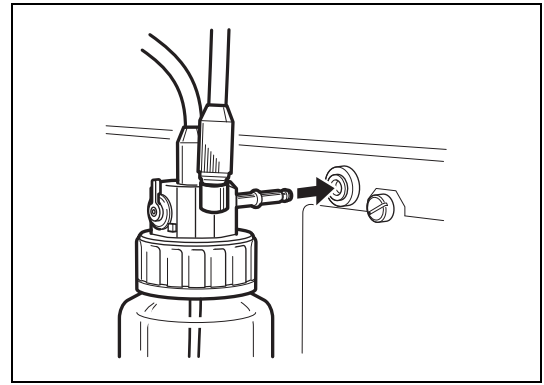


Figure 2.4

- 5** Insert the air/water connector into the air/water port of the PVE connector. (Refer to Figure 2.5)

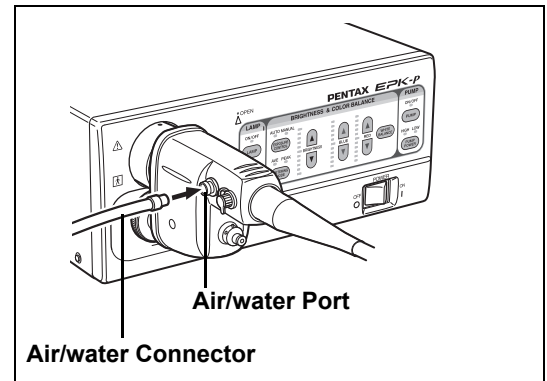


Figure 2.5

- 6** Connect the suction tube of the suction unit to the suction nipple of the PVE connector. (Refer to Figure 2.6)

CAUTION

- Make sure the scope is inserted slowly and correctly.
- Do not use the scope locking lever to help move the processor.

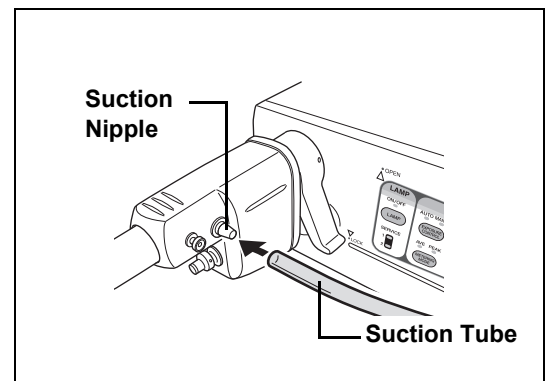


Figure 2.6

Connecting a Fiberscope

Insert the light guide of the fiberscope into the light guide attachment of the processor. (Refer to Figure 2.7)

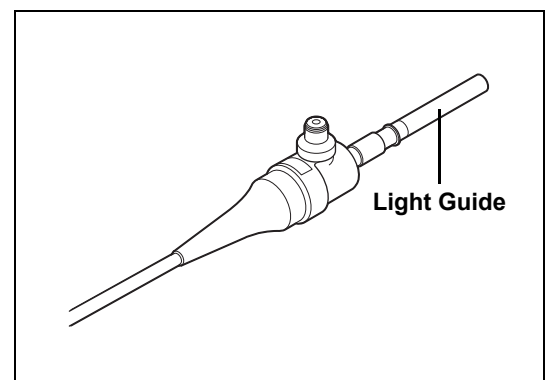


Figure 2.7

3 Pre-use Inspections

Be sure to perform the following inspections before you use the processor. If you discover any abnormality, stop using the processor immediately and contact our service personnel.

When using the processor for the very first time, open the lamp housing cover and check the followings:

- Both of two lamps are securely attached
- Lamp socket is not disconnected
- Position of slide plate for lamp mounting is not out of alignment.

Check the following before you begin the inspections:

- The processor is turned off.
- The processor is installed in a stable and level location.
- The scope is connected properly.
- The lamp life indicator is not orange.
- The water bottle is prepared properly and connected correctly.
- The keyboard is connected properly.


WARNING

Be sure to supply power to the processor and peripheral devices from the SAT-1300 isolation transformer specified by PENTAX or another medical isolation transformer.

Power and Lamp Inspection

1 Turn on the monitor and peripheral devices.

2 Press the power switch to turn on the processor and make sure the front panel lights illuminate.

- If pressing the power switch does not turn on the processor, check the fuse.
 "Replacing the Fuses" (P.46)

3 Press .


4 Make sure the Lamp light illuminates and the distal end of the scope emits light.

- You can have the lamp light come on based on one of the three following configurations:
Start: The lamp lights when the processor is turned on.
Off: The lamp remains off after turning on the process until the lamp switch is pressed.
Lock Lever: The lamp light will come on once the locking lever is moved all the way to the LOCK position.

 [Menu] Key → [Set Up] → [Lamp] (P.34)

5 Make sure that the SERVICE lights 1 and 2 are green.

CAUTION

- The lamp life for the EPK-p processor is 50 hours. Check the service lamp life indicator on the front panel before you use the processor. If the service light is orange for either service light 1 or 2 and "Please replace lamp (1 or 2)" appears on the monitor, replace the affected lamp.
 "Replacing the Lamp" (P.44)
- Do not look directly at the light emitted from the distal end of the scope.

Automatic Brightness Control Inspection

Check the video images from the scope on the monitor while the lamp is lit.

- 1** Bring the distal end of the scope to about 1 cm from the palm of your hand and then slowly move it away until it is about 5 cm from your hand while making sure the brightness of your hand displayed on the monitor is uniform.
Next, point the distal end of the scope towards a room light and make sure the amount of light emitted from the distal end decreases.
Point the distal end towards the palm of your hand again and make sure light is emitted. (Refer to Figure 3.1)

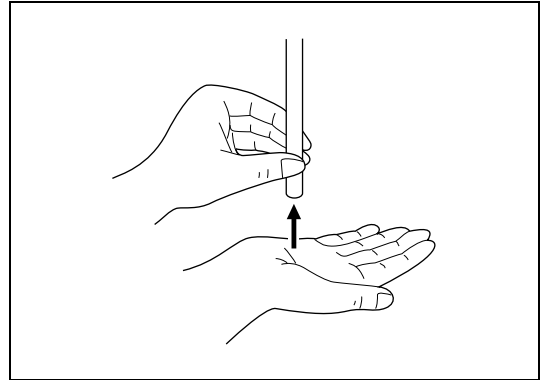


Figure 3.1

Scope Control Buttons Inspection

- 1** Press each button on the control body of the endoscope and make sure a confirmation tone sounds. (Refer to Figure 3.2)
 - For details on each of the buttons on the control body of the endoscope, refer to the owner's manual for the scope.

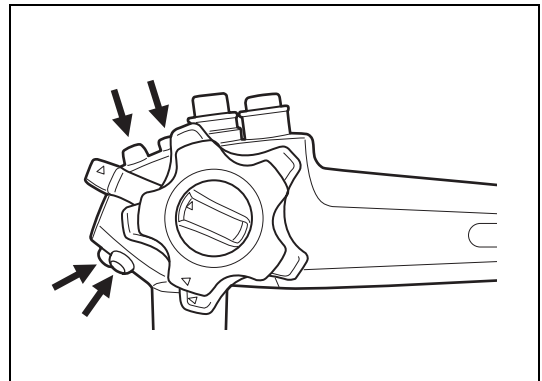






Figure 3.2

Inspection of Operation Panel Buttons

- 1** Press  and select [MANUAL].
 - The selected item will be highlighted green. Each press switches the item between [AUTO] and [MANUAL].
- 2** Press  of [BRIGHTNESS].
 - Make sure the indicator changes with each press.
- 3** Press  and select [AUTO].
- 4** Press  and make sure the selected item is highlighted.
 - Each press switches the items between [AVE] and [PEAK].

Air/Water Supply Inspection

- 1 Press **PUMP**.
 - The [PUMP] light will turn green.
- 2 Press **PUMP POWER** to select a level.
- 3 Air/water is supplied through the scope. If you insert the distal end of the scope into water and gently cover the air hole on the air/water valve of the scope, air comes out of the distal end of the scope. You can confirm the air supply by checking whether air bubbles are generated. (Refer to Figure 3.3)

NOTE

Be sure to use sterile water.

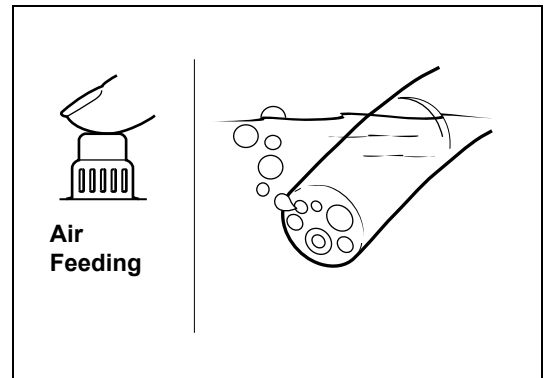


Figure 3.3

- 4 Fully press the air/water valve of the scope and make sure water comes out of the distal end of the scope. (Refer to Figure 3.4)

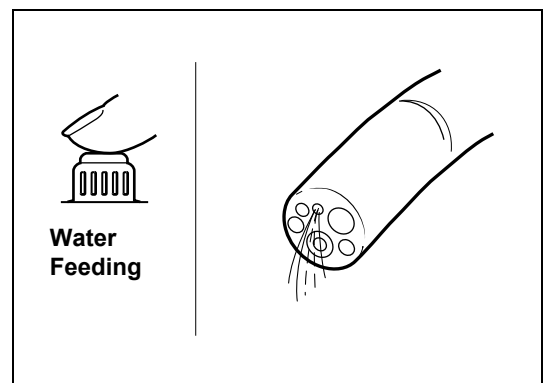


Figure 3.4

Color Tone Inspection

- 1 Adjust the white balance before you inspect the color tones.
 - ☞ "White Balance Switch" (P.27)
- 2 Gently place a hand around the distal end of the scope and make sure the color tones of your hand displayed on the monitor are natural. (Refer to Figure 3.5)
- 3 Press the red or blue **▲▼** buttons to adjust the color tone. Make sure the indicator moves for the corresponding color tone and that the image of your hand on the monitor changes accordingly.

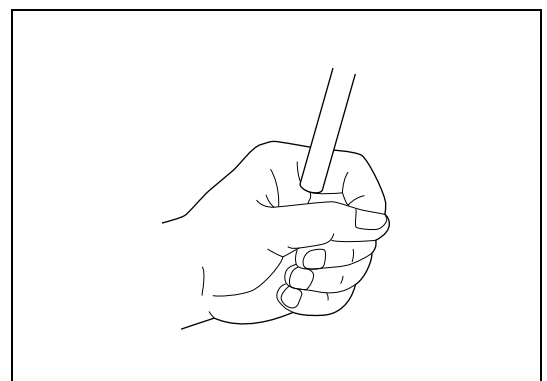


Figure 3.5

Suction Inspection

- 1 Press the suction control valve of the scope down completely and verify that water is being sucked into the distal end of the scope. (Refer to Figure 3.6)**
 - Perform this operation on an endoscope with an instrument channel.

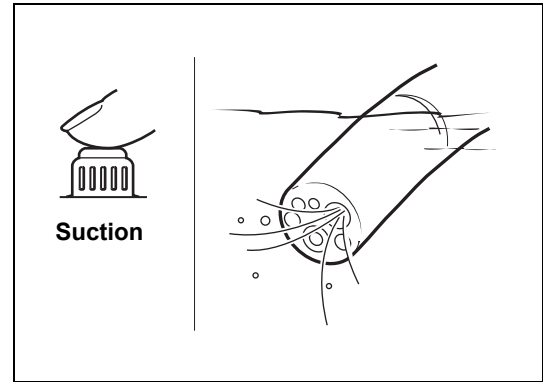


Figure 3.6

CAUTION

Only perform an endoscopic examination if all the inspected items are working properly. If any of the above functions are not working properly or you feel there is an abnormality, stop using the scope immediately and contact PENTAX service.

4 Operating Procedure

Turning On/Off the Processor

1 Turn on the power switch on the front panel of the processor. (Refer to Figure 4.1)

- The processor turns on and the screen for normal mode appears on the monitor.
 - ☞ "Normal Screen" (P.24)
- The patient information from the last time the processor was used will be displayed on the monitor.

2 Turn off the power switch when you want to turn off the power.

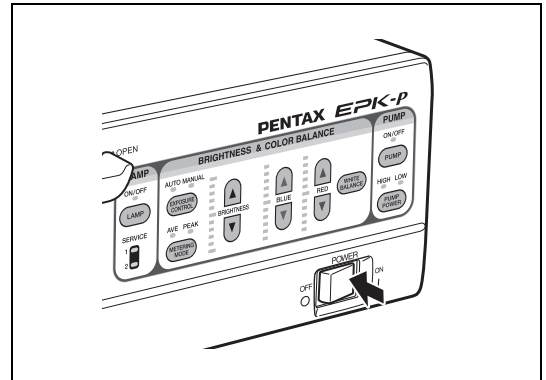


Figure 4.1

CAUTION

- Do not turn the power off and then on again within a short period of time. Doing so may blow a fuse.
 - ☞ "Replacing the Fuses" (P.46)
- Do not use a sharp object such as the tip of a pen to press the keys on the front panel.
- Do not use the end of the scopes' light guide to operate the keys or switches.

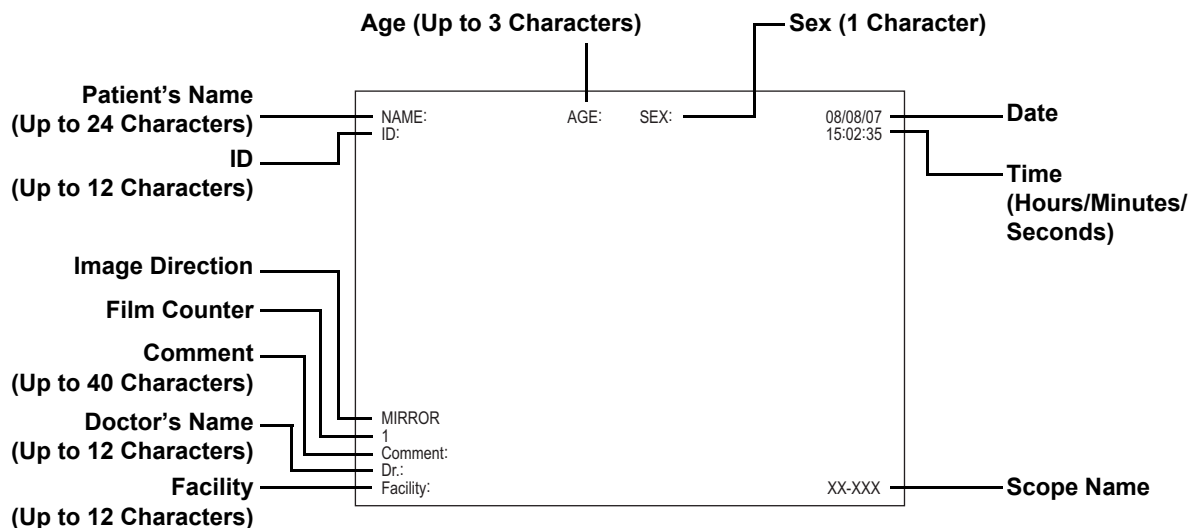
Monitor Screens

Normal Screen

The normal screen shown below appears on the monitor when you turn on the processor.

You can change which items appear on the normal screen in the [Display] settings.


☞ "Settings in the [Display] Tab" (P.35)

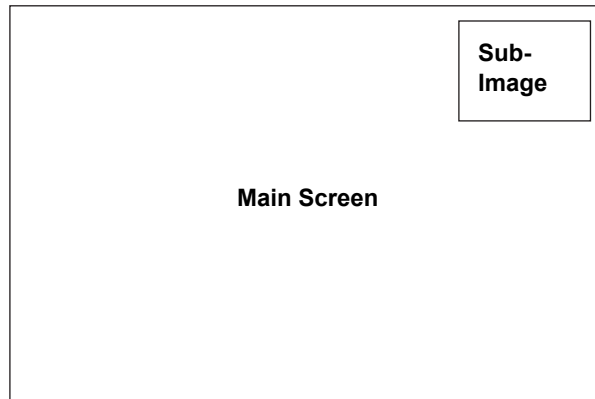


Freeze Screen

While frozen, the scope video is displayed in a sub-image on the monitor.

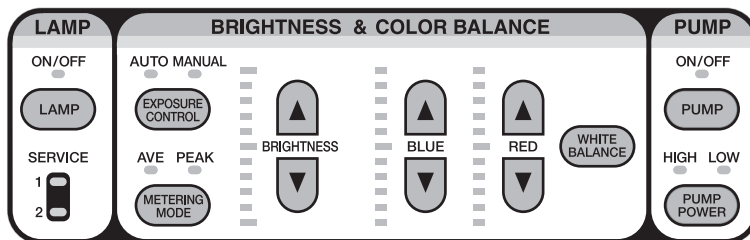
The date and time are hidden when the sub-image is displayed. You can change the display position of the sub-image in the [Display] settings.

 "Settings in the [Display] Tab" (P.35)



Front Panel Operations

4



CAUTION

- Do not use a sharp object such as the tip of a pen to press the switches on the front panel.
- Do not use the end of the scopes' light guide to operate the keys or switches.




LAMP

Lamp Switch

1 Press .

- The processor lamp and lamp indicator will illuminate. After the lamp lights, any scope connected to the processor will emit light out of its distal end.

CAUTION

- About the Lamp Life:
 - The lamp life for the EPK-p processor is 50 hours. Check the service lamp life indicator on the front panel before you use the processor. If the service light is orange for either service light 1 or 2 and "Please replace lamp (1 or 2)" appears on the monitor, replace the affected lamp.
 -  "Replacing the Lamp" (P.44)
- If the lamp does not light:
 - If the lamp does not light when you press the , LAMP button, check the service light lamp indicators on the front panel and replace any bad lamps by referring to "Replacing the Lamp" (P.43).
- To turn off the lamp:
 - After use, be sure to press  to turn the lamp off.

Exposure Control Switch

You can select from two exposure control methods for adjusting the brightness of images appearing on the monitor.

[AUTO]: The brightness is adjusted automatically so that the brightness set with the brightness adjustment switch is uniform across the monitor.

[MANUAL]: The brightness set with the brightness adjustment switch is output as is without any adjustments being made.

1 Press repeatedly and select a setting.

- Each press switches the item between [AUTO] and [MANUAL].
- The indicator light of the selected item will illuminate green.

Measuring Method Switch

If the exposure control method is set to [AUTO], you can select from two measuring methods.

[AVE]: Control exposure based on the average brightness value for the whole screen.

[PEAK]: Control exposure based on the maximum brightness value for the screen.

CAUTION

[AVE] should be selected for normal operation.

1 If the exposure control method is set to [AUTO], press repeatedly and select a setting.

- Each press switches the item between [AVE] and [PEAK].
- The indicator light of the selected item will illuminate green.

Pump Switch

1 Press .

- Each press switches the item between [ON] and [OFF].
- When the power is turned on, the indicator light will illuminate green.

Pump Power Switch

This switch sets the strength of the air supply flow of the pump.

[HIGH]: Sets the air supply flow of the pump to a strong level.

[LOW]: Sets the air supply flow of the pump to a weak level. The level is always set to [LOW] when the power is turned on.

1 Press .

- Each press switches the item between [HIGH] and [LOW].
- When the power is turned on, the indicator light will illuminate green.

WARNING

It must be recognized that variations in air flow (pressure and volume) for patient insufflation may exist from one manufacturer's equipment (light source, processor and/or scope type) to another. It is, therefore, important to closely monitor the patient at all times and to aspirate excessive air to prevent overinsufflation and potential pneumatic perforation.

CAUTION

- Regardless of pump level setting selected, avoid delivering too much air to minimize the potential for pneumatic perforation or barotrauma.
- Be careful not to deliver too much air.

NOTE

Should debris on the objective lens be difficult to clean, one can temporarily use a higher pump level setting on the video processor or light source.





While doing so, simultaneously activate the air and suction control valves to minimize air insufflation. After the lens has been cleared return the air pressure to its original setting for routine use. Regardless of pump level setting selected, avoid delivering too much air.



Adjustment Switches

You can manually adjust the brightness and color tone of images appearing on the monitor.

1 Press the or controls for [BRIGHTNESS], [BLUE], and [RED].

- Each press of  or  increases or decreases the brightness or color tone. Each press of  increases the item by one step and each press of  decreases the item by one step.
- The level of an adjusted item is indicated on the corresponding indicator of the front panel, and the value is displayed on the monitor. Note that the normal setting is 0 in case you make adjustments.

CAUTION

The exposure control method, measuring method, and brightness adjustment settings are stored in memory even if you turn off the processor.

4

WHITE
BALANCE

White Balance Switch

Adjust the white balance each time you connect a scope to the processor. You can also adjust it whenever you feel that it needs to be adjusted.

1 Connect the scope to the processor, turn on the processor, and set the exposure control function to [AUTO].

2 Press the button to emit light from the distal end of the scope. (Refer to Figure 4.2)

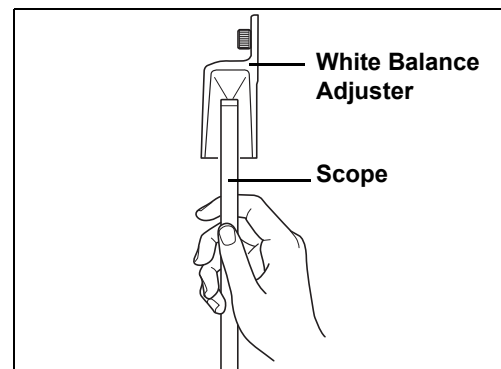



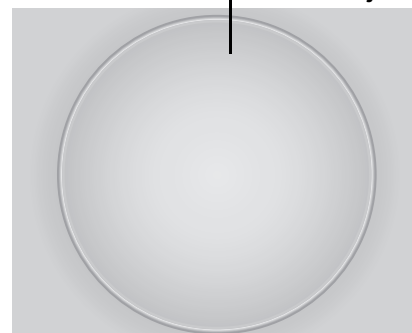
Figure 4.2

3 Insert the distal end of the scope into the supplied white balance device and position it so that the image of the circle at the bottom of the adjuster fills the monitor.

4 Hold the distal end of the scope in place without moving it and press for at least 2 seconds.

- The [W/B Proceeding] message appears on the monitor and the white balance is adjusted. After the white balance is set, [W/B OK] appears on the monitor for about 5 seconds.




















Normal Screen  Circle at the Bottom of the Adjuster








Keyboard Operations

Function Key Operations

The following list shows the functions assigned to the function keys of the keyboard designed specifically for use with the processor.

General-purpose Keyboard	Key Name	Function Outline	Reference Page
	[Patient] key	Display the patient list.	P.30
	[New patient] key	Register new patient data.	P.30
	[Clear patient] key	Clear patient data.	P.31
	[User] key	Display the user list.	P.32
	[Noise reduction] key	Change the noise reduction setting.	P.32
	[Setting menu] key	Display the setting menu.	P.33
	[Enhancement] key	Set the screen enhancement.	P.33
	[Zoom] key	Set the magnification ratio.	P.33
	[Contrast] key	Change the contrast setting.	P.34
	[Menu] key	Display the configuration screen.	P.34
	[Stop watch] key	Operate the stop watch.	P.38
	[Film counter reset] key	Reset the film counter.	P.38
	[Character off] key	Show/hide the text information items.	P.39
	[Total hours] key	Display the total on time and total lamp usage time.	P.39
	[Initialize] key	Initialize the settings.	P.40
	[Scope button 1] key	Activate the function assigned to scope button 1.	P.40
	[Scope button 2] key	Activate the function assigned to scope button 2.	P.40
	[Scope button 3] key	Activate the function assigned to scope button 3.	P.40
	[Scope button 4] key	Activate the function assigned to scope button 4.	P.40

General-purpose Keyboard	Key Name	Function Outline	Reference Page
	[Freeze] key	Switch between freeze mode and video mode.	P.40
	[Remote out] key	Output the image to an external device.	P.41
	[Capture] key	Output the image to a PC.	P.41
	[Processor option] key	Set the menu color and enhancement.	P.41
	[Change beep tone] key	Switch the beep tone setting between ON, OFF, and Alphabet OFF.	P.41

CAUTION

- Do not use a sharp object such as the tip of a pen to press the keys on the keyboard.
- Do not use the end of the light guide on the scope to operate keys or switches.

Function of Each Key



[Patient] Key

Display the patient list.

1 Press the [Patient] key.

- The [Patient's List Preset 1] screen (registration numbers 1 to 10) appears.
- Press the [Patient] key to switch the display between the patient list and the normal screen.

2 Use the [↑][↓]/[Tab] keys to select a patient.

- Use the [↑][↓]/[Tab] keys to move to the [Patient's List Preset 2] screen.

3 Press the [→] key.

- The [Patient's xx Information] screen for the selected patient appears. The registration number in the patient list appears instead of [xx].
- Follow the procedure below to enter or change data in [Patient's xx Information].
 - ① Use the [↑][↓]/[Tab] keys to select an item.
 - ② Use the alphanumeric keys to enter or change data.
 - ③ Press the [Enter] key or [Esc] key. The [Patient's List Preset 1 to 4] screen reappears.
Pressing the [Enter] key reflects any data entered and changes made and pressing the [Esc] key discards any data entered and changes made.

4 To enter or change data for another patient, use the [↑][↓]/[Tab] keys to select a patient and repeat Step 3.

5 Press the [Enter] key or [Esc] key.

- Pressing the [Enter] key returns to the normal screen with the information of the patient selected in the [Patient's List Preset 1 to 4] screen.
- Pressing the [Esc] key returns to the normal screen displayed prior to the [Patient's List Preset 4] screen.

CAUTION

If the capture function is enabled, do not use any special symbols such as the ones below for [Name] and [ID].
¥ / : * ? " < >

[Patient's List Preset 1] Screen

Patient's List Preset 1			
Name	ID	Age	Sex
1. Thomas Smith	N0001	31	M
2. Michael Brown	N0002	24	M
3. Elizabeth Lewis	E0001	67	F
4. William White	S0001	29	M
5. Rachel Taylor	A0001	89	F
6. Robert Moore	N0003	53	M
7. Mary Clark	S0002	54	F
8. Christine Baker	A0002	16	F
9. Richard Walker	C0001	76	M
10. Linda Green	N0004	45	F

Select: ↑/↓ Display: Enter F3: Reset Data
Edit Info: → Cancel: Esc Scroll Page: PageUp/PageDown

[Patient's xx Information] Screen

Patient Information	
Name	Thomas Smith
ID	N0001
AGE	31
SEX	M
COMMENT	Good nutrition

Select: ↑/↓ Display: Enter F3: Reset Data
Cancel: Esc



[New patient] Key

Register new patient data.

1 Press the [New patient] key.

- The [Patient's Information] screen appears.

2 Use the [↑][↓]/[Tab] keys to select an item.

3 Use the alphanumeric keys to enter or change data.

4 Press the [Enter] key or [Esc] key.

- The normal screen reappears.
- Pressing the [Enter] key returns to the normal screen where any data that was entered and any changes that were made on the [Patient's Information] screen are reflected.
- Pressing the [Esc] key returns to the normal screen where any changes to settings made on the [Patient's Information] screen are discarded and the existing data is displayed.

[Patient's Information] Screen

Patient Information	
Name	
ID	
AGE	
SEX	
COMMENT	

Select: ↑/↓ Display: Enter F3: Reset Data
Cancel: Esc



[Clear patient] Key

Clear patient data.

Pressing the [Clear patient] key while the [Patient's List Preset 1 to 4] screen is displayed clears the data for all patients.

Pressing the [Clear patient] key while the normal screen or [Patient's Information] screen is displayed clears the data for that patient.

1 Press the [Clear patient] key.

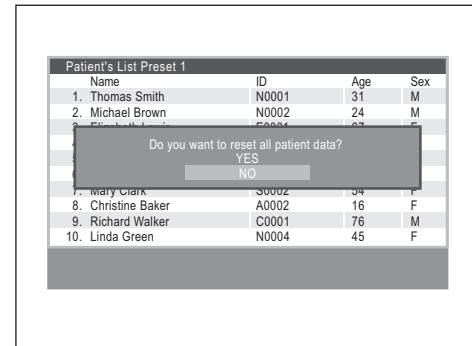
- A confirmation message for clearing the data appears.

Screen Displayed	When [YES] is Selected	When [NO] is Selected
[Patient's List Preset 1 to 4] Screen	All the patient data is cleared.	The registered data is retained.
[Patient's xx Information] Screen	The displayed patient data is cleared.	
Normal Screen		

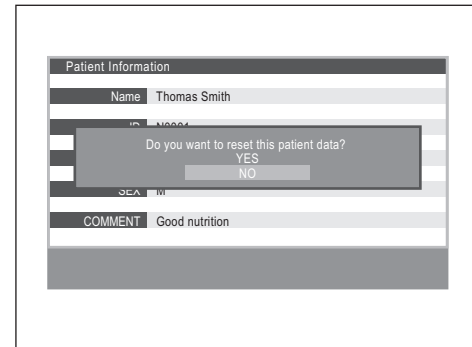
2 Use the [↑] and [↓] keys to select [YES] or [NO] and press the [Enter] key.

- The normal screen reappears.

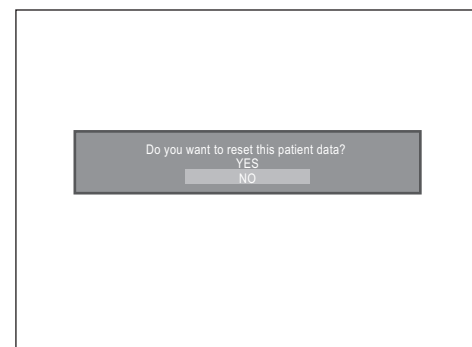
[Patient's List Preset 1 to 4] Screen



[Patient's xx Information] Screen



Normal Screen





[User] Key

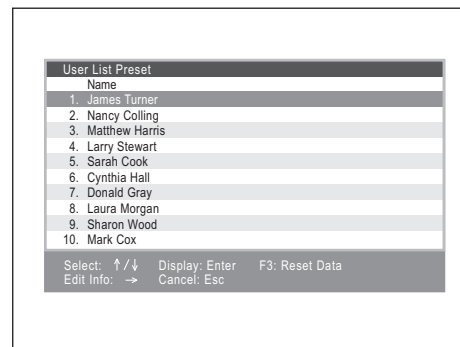
Display the user list.

1 Press the [User] key.

- The [User List Preset] screen (registration numbers 1 to 10) appears.

2 Use the [↑] and [↓] keys to select a user.

[User List Preset] Screen



3 Press the [→] key.

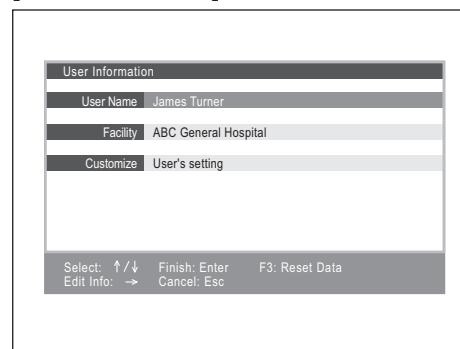
- The [User Information] screen for the selected user appears.
- Follow the procedure below to enter or change data on [User Information] screen.

① Use the [↑][↓]/[Tab] keys to select an item.

② Use the alphanumeric keys to enter or change data.

③ Press the [Enter] key to save changes or the or [Esc] key to discard changes. The [User List Preset] screen reappears. Pressing the [Enter] key will save the changes made and pressing [Esc] discards any changes made.

[User Information] Screen



4 To enter or change data for another user, use the [↑][↓]/[Tab] keys to select a user and repeat Step 3.

5 Press the [Enter] key or the [Esc] key.

- The normal screen reappears.
- Pressing the [Enter] key returns to the normal screen with the information of the user selected on the [User List Preset] screen.
- Pressing the [Esc] key returns to the normal screen with no changes made to the on screen information.

4



[Noise reduction] Key

Change the noise reduction setting.

1 Press the [Noise reduction] key.

- The current noise reduction setting appears on the monitor for about 3 seconds.

2 Press the [Noise reduction] key or the [←] or [→] key repeatedly to cycle through the settings of [Off], [Low], [Medium], and [High]. (Default setting: [Off])

3 Press the [Enter] key or the [Esc] key.

- Pressing the [Enter] key returns to the normal screen where any change to the noise reduction setting will be reflected.
- Pressing the [Esc] key returns to the normal screen where any change to the noise reduction setting will be discarded.
- If you do not press any key for a few seconds, the normal screen is displayed automatically and any change to the noise reduction setting will be reflected.





[Setting menu] Key

Display the setting menu.

1 Press the [Setting menu] key.

- The [Setting Menu] screen appears on the monitor. You can confirm the current settings and the peripheral devices being used.

2 Press the [Setting menu] key, the [Enter] key or [Esc] key.

- The normal screen reappears.

Scope Name:	Brightness:	0	
Scope S/N:	Color Red:	0	
	Blue:	0	
Lamp:	Off	Contrast:	Normal
Buzzer:	Alphabet key Off	Zoom:	Off
Button 1:	Freeze	Enhancement:	Off
Button 2:	Trigger		
Button 3:	Zoom	Noise Reduction:	Off
Button 4:	Ave/Peak	Image Size:	Normal



[Enhancement] Key

Set the screen enhancement.

1 Press the [Enhancement] key.

- The current enhancement setting appears on the monitor for about 3 seconds.

2 Press the [Enhancement] key or the [←] or [→] key repeatedly to cycle the settings of [Off], [Low], [Medium], and [High]. (Default setting: [Off])

3 Press the [Enter] key or [Esc] key.

- Pressing the [Enter] key returns to the normal screen where any change to the magnification setting will be reflected.
- Pressing the [Esc] key returns to the normal screen where any change to the magnification setting will be discarded.
- If you do not press any key, the normal screen is redisplayed automatically and any change to the enhancement setting is reflected.



4



[Zoom] Key

Set the magnification ratio.

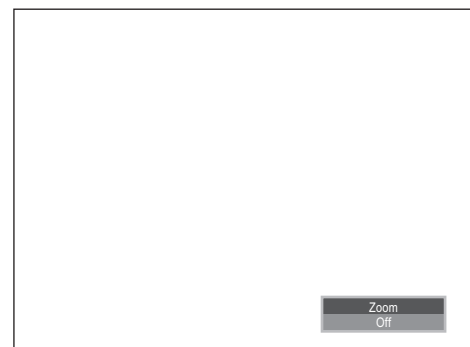
1 Press the [Zoom] key.

- The current magnification setting appears on the monitor for about 3 seconds.

2 Press the [Zoom] key or the [←] or [→] key repeatedly to change the setting to any of [Off], [×1.2], [×1.5], and [×2.0]. (Default setting: [Off])

3 Press the [Enter] key or [Esc] key.

- Pressing the [Enter] key returns to the normal screen where any change to the magnification setting is reflected.
- Pressing the [Esc] key returns to the normal screen where any change to the magnification setting is not reflected.





[Contrast] Key

Change the contrast setting.

1 Press the [Contrast] key.

- The current contrast setting appears on the monitor for about 3 seconds.

2 Press the [←] or [→] key repeatedly to cycle through the settings of [Normal], [High], and [Low]. (Default setting: [Normal])

3 Press the [Enter] key or [Esc] key.

- Pressing the [Enter] key returns to the normal screen where any change to the contrast setting will be reflected.
- Pressing the [Esc] key returns to the normal screen where any change to the contrast setting will be discarded.
- If you do not press any key for a few seconds, the normal screen will be displayed automatically and any changes to the contrast setting will be reflected.



[Menu] Key

4

Display the configuration screen.

1 Press the [Menu] key.

- The configuration screen appears.
- The configuration screen contains the [Set Up] tab, [Display] tab, and [Process] tab.

2 Position the cursor on a tab and use the [←]/[→]/[Tab] keys to select a tab.

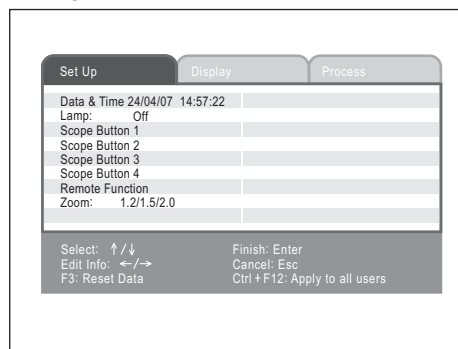
3 Use the [↑] and [↓] keys to select a setting and press the [→] key.

- The method used to configure a setting will depend on the setting being changed. Some settings require pressing the [←] or [→] key repeatedly to change the value and some settings require advanced settings to be configured on a sub-screen.

4 Press the [Enter] key or [Esc] key.

- Pressing the [Enter] key returns to the normal screen where any changes to the settings will be reflected.
- Pressing the [Esc] key returns to the normal screen where any changes to the settings will be discarded.

Configuration Screen



Settings in the [Set Up] Tab

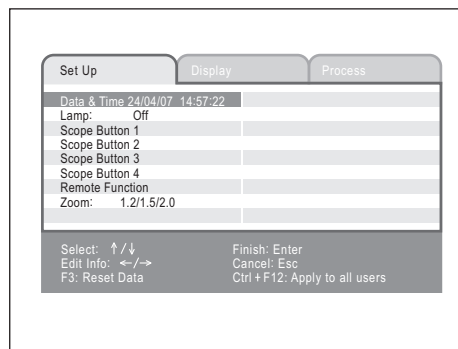
[Date & Time]: Change the date and time and display format.

- Pressing the [→] key displays the [Date & Time] screen.
- [Format]:** Select a display format for the date and time from [YY/MM/DD], [MM/DD/YY], and [DD/MM/YY]. (Default setting: [DD/MM/YY])
- [Year]/[Month]/[Date]/[Hour]/[Minute]/[Second]:** Change the date and time.

[Lamp]: Change the lamp mode operation setting for when the processor is turned on.

- Press the [←] or [→] key repeatedly to change the setting to any of [Start] (the lamp lights when you turn on the processor), [Off] (the lamp remains off when you turn on the processor but lights when the lamp switch is pressed), and [Lock Lever] (The lamp lights when the scope locking lever is moved all the way to the LOCK position.). (Default setting: [Off])

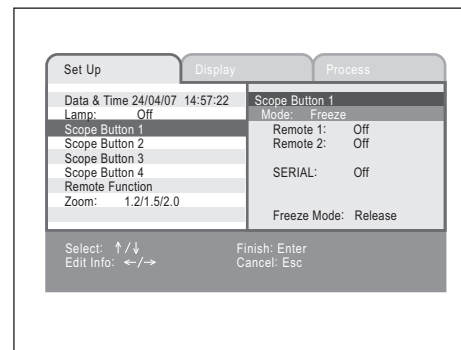
[Set Up] Tab



[Scope Button 1], [Scope Button 2], [Scope Button 3], and [Scope Button 4]: Customize the functions of the scope buttons.

- Pressing [→] displays the scope button customize screen. The name of the function assigned currently appears for [Mode]. Press the [←] or [→] key to cycle through the settings of [Trigger], [Freeze], [Zoom], [Ave/Peak], and [None]. There may be an option to configure advanced custom settings when you assign some functions.
- Settings that can be configured on the customization screen: [Remote 1], [Remote 2], [Remote 3] and [SERIAL]
[Freeze Mode]: Determines whether freeze mode ends after you press a button to copy an image in freeze mode or stays frozen. Set to [Release] to end freeze mode and set to [Keep] to have the image frozen.
- Press the [Esc] key to return to the configuration screen where any changes to settings in the customization screen will be discarded.

[Scope Button 1] Screen



[Remote Function]: Change the remote function and counter settings.

- Pressing [→] displays the remote function customization screen.
- Settings configurable on the customization screen:
[Remote 1] and [Remote 2]: [Pulse] or [Toggle] (Default setting: [Pulse])
[Film Counter]: [F1 to 99]/[F1/2]/[F1/4]/[F1/8]/[F1/16] (Default setting: [F1 to 99])

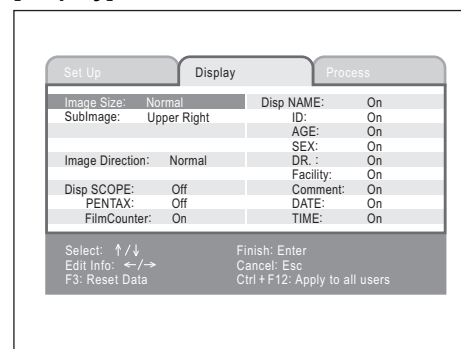
[Zoom]: Switch the zoom of the magnification function to any of [2.0], [1.5], [1.2], [1.2/1.5/2.0], [1.2/1.5], [1.5/2.0], [1.2/2.0], [1.2/1.5/1.2], [1.5/2.0/1.5], [1.2/2.0/1.2] and [1.2/1.5/2.0/1.5/1.2]. (Default setting: [1.2/1.5/2.0])

Settings in the [Display] Tab

[Image Size]: Change the size of the main screen.

- Press the [←] or [→] key repeatedly to change the setting to [Normal] or [Medium]. (Default setting: [Normal])

[Display] Tab



[Normal]



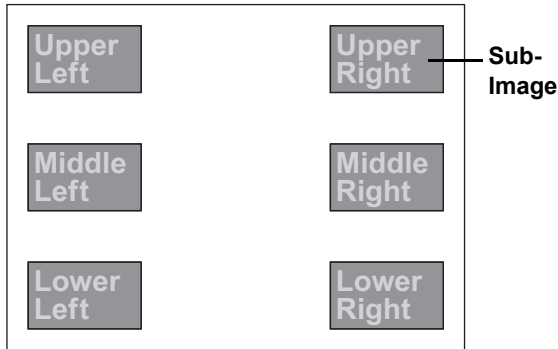
[Medium]



[Sub Image]: Change the display position of the sub-image.

- Press the [←] or [→] key repeatedly to change the setting to any of [Upper Right], [Middle Right], [Lower Right], [Upper Left], [Middle Left] and [Lower Left].
- Sub image can only be displayed in [Upper Right] position when [Medium] is selected for the [Image Size].

[Upper Right]/[Middle Right]/[Lower Right]/
[Upper Left]/[Middle Left]/[Lower Left]



[Image Direction]: Change the display direction of the main screen and sub-image.

- Press the [←] or [→] key repeatedly to change the setting to any of [NORMAL], [MIRROR] and [ROTATE]. (Default setting: [NORMAL])

[NORMAL]



[MIRROR]



[ROTATE]



[SCOPE], [PENTAX], [Film Counter], [Name], [ID], [AGE], [SEX], [DR.], [Facility], [Comment], [DATE], and [TIME]:
Show/hide display items.

- Select a display item and press the [←] or [→] key repeatedly to change the setting to [On] or [Off]. (Default setting: [Off] for [SCOPE] and [PENTAX], [On] for all other items)

Settings in the [Process] Tab

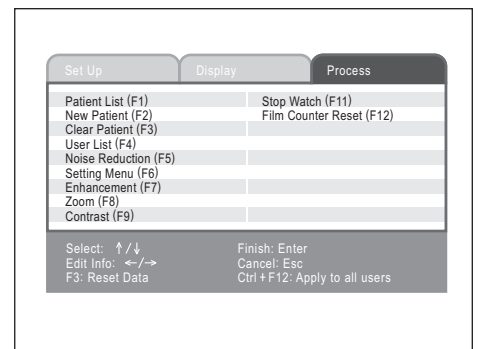
[Patient List (F1)]: Display the [Patient's List Preset 1 to 4] screen.

- Pressing the [→] key closes the configuration screen and displays the [Patient's List Preset 1 to 4] screen.
- The page for the patient list data currently displayed appears on the [Patient's List Preset 1 to 4] screen.
- Perform [Patient's List Preset 1 to 4] screen operations in the same way as when you display the screen by pressing the [Patient] key.
 "[Patient] Key" (P.30)

[New Patient (F2)]: Display the [Patient Information] screen.

- Pressing the [→] key closes the configuration screen and displays the [Patient Information] screen.
- Perform [Patient Information] screen operations in the same way as when you display the screen by pressing the [New patient] key.
 "[New patient] Key" (P.30)

[Process] Tab



[Clear Patient (F3)]: Display the [Patient Information] screen.

- Pressing the [→] key closes the configuration screen and displays a confirmation screen for resetting patient information.
- Use the [↑] or [↓] key to select [YES] and press the [Enter] key to close the message and clear the patient information.
- If you select [NO] or do not perform an operation for at least 5 seconds, the message closes without any patient information being cleared.

[User List (F4)]: Display the [User List Preset] screen.

- Pressing the [→] key closes the configuration screen and displays the [User List Preset] screen.
- Perform [User List Preset] screen operations in the same way as when you display the screen by pressing the [User] key.
👉 "[User] Key" (P.32)

[Noise Reduction (F5)]: Change the noise reduction setting.

- Pressing the [→] key closes the configuration screen and displays the current noise reduction setting on the monitor for about 3 seconds.
- Change the noise reduction setting in the same way as when you change the setting by pressing the [Noise reduction] key.
👉 "[Noise reduction] Key" (P.32)

[Setting Menu (F6)]: Display the [Setting Menu] screen.

- Pressing the [→] key closes the configuration screen and displays the [Setting Menu] screen on the monitor.
- Perform [Setting Menu] screen operations in the same way as when you display the screen by pressing the [Setting menu] key.
👉 "[Setting menu] Key" (P.33)

[Enhancement (F7)]: Change the enhancement setting.

- Pressing the [→] key closes the configuration screen and displays the current enhancement setting on the monitor for about 3 seconds.
- Change the enhancement setting in the same way as when you change the setting by pressing the [Enhance level] key.
👉 "[Enhancement] Key" (P.33)

[Zoom (F8)]: Change the magnification setting.

- Pressing the [→] key closes the configuration screen and displays the current magnification setting on the monitor for about 3 seconds.
- Change the magnification setting in the same way as when you change the setting by pressing the [Zoom] key.
👉 "[Zoom] Key" (P.33)

[Contrast (F9)]: Change the contrast setting.

- Pressing the [→] key closes the configuration screen and displays the current contrast setting on the monitor for about 3 seconds.
- Change the contrast setting in the same way as when you change the setting by pressing the [Contrast] key.
👉 "[Contrast] Key" (P.34)

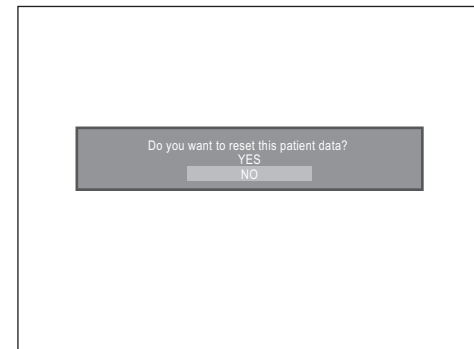
[Stop Watch (F11)]: Operate the stop watch.

- Pressing the [→] key closes the configuration screen and displays the sub-menu for the stop watch.
- Operate the stop watch in the same way as when you change the settings by pressing the [Stop Watch] key.
👉 "[Stop watch] Key" (P.38)

[Film Counter Reset (F12)]: Reset the film counter.

- Pressing the [→] key closes the configuration screen and changes the film counter indication on the monitor to [1].
- You can also reset the film counter by pressing the [Clear counter] key.
👉 "[Film counter reset] Key" (P.38)

Confirmation Screen for Resetting Patient Information





[Stop watch] Key

Operate the stop watch.

1 Press the [Stop watch] key.

- The submenu of the stop watch appears.

2 Use the [↑] or [↓] key to select [START] and press the [Enter] key.

- The stop watch appears and timing starts.

3 Use the [↑] or [↓] key to select [STOP] and press the [Enter] key.

- The stop watch stops timing and the final time is displayed.

4 Use the [↑] or [↓] key to select [RESTART] and press the [Enter] key.

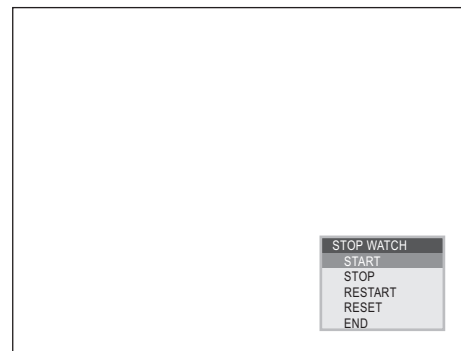
- Timing resumes from the final time when you selected [STOP].

5 Use the [↑] or [↓] key to select [RESET] and press the [Enter] key.

- The time of the stop watch is reset.

6 Use the [↑] or [↓] key to select [END] and press the [Enter] key.

- The submenu of the stop watch closes and the normal screen reappears.



4

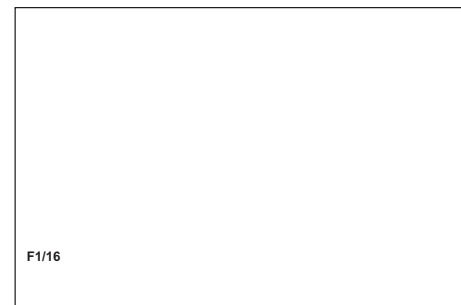


[Film counter reset] Key

Reset the film counter.

1 Press the [Film counter reset] key.

- The film counter is reset and the film counter indication on the monitor changes to [1]. (Default setting: [1])





+



[Character off] Key

Show/hide the text information items.

1 Press the [Character off] key.

- Each press of the [Character off] key shows/hides the text information items on the monitor. (Default setting: [Show])

When the Text Information Items are Shown

NAME: ID:	AGE:	SEX:	08/08/07 15:02:35
MIRROR 1 Comment: Dr: Facility:			
			XX-XXX

When the Text Information Items are Hidden



4



+



+



[Total hours] Key

Display the total on time of the processor.

1 Press the [Total hours] key.

- Show the total time the processor has been on as information on the monitor.
- If you press the [Total hours] key, the [Enter] key or [Esc] key, the normal screen reappears.

NAME: ID:	AGE:	SEX:	08/08/07 15:02:35
MIRROR 1 Comment: Dr: Facility:			
			TOTAL 00:00:00 XX-XXX



[Initialize] Key

Initialize the settings.

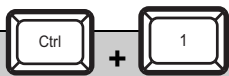
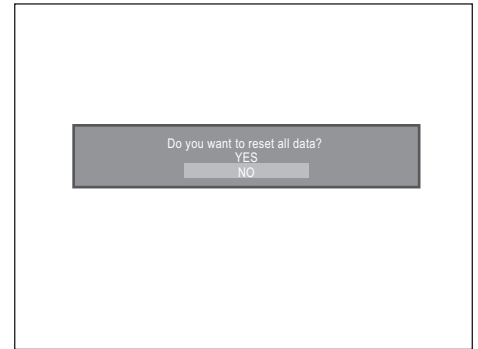
1 Press the [Initialize] key.

- The [Do you want to reset all data?] confirmation message appears.

2 Use the [↑] or [↓] key to select [YES] and press the [Enter] key.

- The confirmation message closes and all settings are reset to their default values.
- If you select [NO] or do not perform an operation for at least 5 seconds, the confirmation message closes and the normal screen reappears.

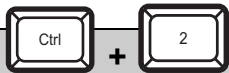
"Default Settings" (P.54)



[Scope Button 1] Key

1 Press the [Scope Button 1] key.

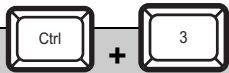
- The function assigned to scope button 1 is activated.



[Scope Button 2] Key

1 Press the [Scope Button 2] key.

- The function assigned to scope button 2 is activated.



[Scope Button 3] Key

1 Press the [Scope Button 3] key.

- The function assigned to scope button 3 is activated.



[Scope Button 4] Key

1 Press the [Scope Button 4] key.

- The function assigned to scope button 4 is activated.

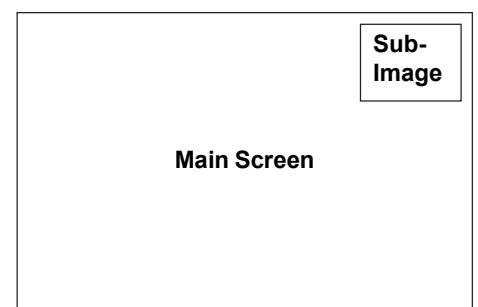


[Freeze] Key

Switch between freeze mode and video mode.

1 Press the [Freeze] key.

- The normal screen is frozen and the scope video is displayed in a sub-image on the monitor.
- If you press the [Freeze] key again, the sub-image disappears from the monitor and the normal screen reappears.



 **[Remote out] Key**

Output the image to an external device.

1 Press the [Remote out] key.

- The image displayed on the monitor is output to a printer or other external output device.

 **[Capture] Key**

Output the image to a PC.

1 Press the [Capture] key.

- Output the image data displayed on the monitor to a PC with Image Capture Software (OS-I1) for the endoscope installed.

 **[Processor option] Key**

Set the menu color and enhancement.

1 Press the [Processor option] key.

- The current setting value appears.

2 Press the [←] or [→] key repeatedly to change the [Menu Color] setting to [Deep] or [Light].

- The current setting value appears.
Deep: Dark color
Light: Light color

3 Press the [←] or [→] key repeatedly to change the [Scope Enhancement] setting to [Disable] or [Enable].

- Disable: Use processor enhancement.
- Enable: Use scope enhancement.

CAUTION

If set to [Disable], be sure to set it back to [Enable] after use. Enhancement may not work properly when you connect the scope you are using to another processor.

4 Press the [Enter] key or [Esc] key.

- Pressing the [Enter] key returns to the normal screen where any changes to the settings are saved and reflected.
- Pressing the [Esc] key returns to the normal screen where any changes to the settings are discarded.

 **[Change beep tone] Key**

Set the beep tone.

1 Press the [Change beep tone] key.

- The beep tone setting switches between ON, OFF, and Alphabet OFF.

5 Maintenance and Storage

After Use Care and Storage

Follow the procedure below after using the processor.

- 1 Turn off the peripheral devices. For details on operating peripheral devices, refer to the instruction manuals for the peripheral devices.**
- 2 Press the power switch to turn off the processor.**
- 3 Remove the scope and water bottle from the processor. (Refer to Figure 5.1)**
 - Remove the scope while keeping it straight and making sure not to use excessive force on the connector part.
- 4 Disconnect the power cord.**

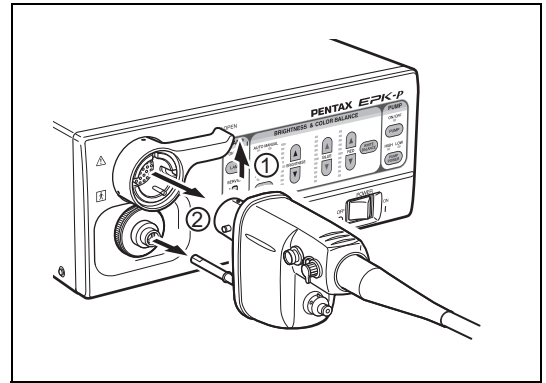


Figure 5.1

- 5 Wipe the surfaces of the processor with a gauze that has been dampened with 70-90% ethyl or isopropyl alcohol.**
 - The procedures below should be followed to decontaminate surfaces of the EPK-p video processor that are suspected of being contaminated.
 - ① Wipe surfaces with a gauze lightly dampened with an enzymatic detergent (neutral pH, low foaming, mild/compatible with PENTAX products, etc.)
 - ② Wipe the same areas with a gauze lightly dampened with clean water (to remove residual detergent)
 - ③ Wipe the processor with a dry gauze or lint-free cloth to remove remaining water/fluids
 - ④ Wipe the surfaces of the processor with a gauze dampened with 70-90% ethyl or isopropyl alcohol
- 6 For details on after use care of the scope and water bottle, refer to the owner's manuals for the scope and water bottle.**

CAUTION

- Turning off the processor prior to turning off any connected peripheral devices may cause the peripheral devices to malfunction.
- Make sure no water gets on the processor when you are performing the after care procedure. In particular, getting the connector parts and ventilation grids wet may cause a malfunction.

Observe the following points on storage.

- Be sure to turn off the processor and disconnect the power cord prior to storage.
- Do not store the processor in a very hot and humid location, or where it is likely to be exposed to water or direct sunlight.
- Store the processor in a location where dust will not enter inside. Wipe off any dust on the processor. Excessive amounts of dust accumulating inside the unit may cause the processor to malfunction, emit smoke, or catch fire.
- Take care not to drop the processor or subject it to an excessive mechanical shock. The processor may become unsafe to use or damaged. If the processor is subject to an excessive mechanical shock, stop using it and contact our service personnel.

Care and Storage of the Water Bottle Set

WATER BOTTLE CLEANING

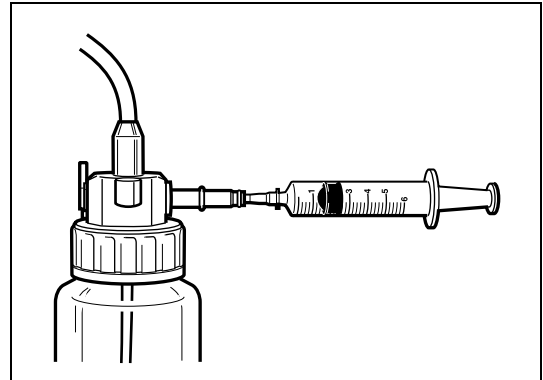
NOTE

Take care in handling the water bottle. Do NOT carry the water bottle by the Air/Water connector or Air/Water hose. When the cap assembly has been separated from the bottle, be careful in handling the water feeding stem.

Water bottles should be sterilized at least on a daily basis. Like all endoscopic accessories, the water bottle assembly must be thoroughly cleaned. Failure to do so could result in incomplete or ineffective sterilization.

CLEANING

- ① Immediately after use, the entire water bottle assembly (bottle, cap assembly and tubing) should be washed with fresh detergent solution and dampened gauze or scrub brush. Complete immersion in a detergent solution should be used for soiled items. Internal surfaces of the water bottle assembly may be exposed to the detergent by injecting the detergent into the air pipe stem (opposite the A/W-DRAIN lever on the water bottle cap) using a syringe. The A/W-DRAIN lever should be set to the A/W position to ensure contact with all internal tubes.
- ② Ultrasonic cleaning of the entire water bottle assembly is recommended to access difficult to reach areas. Use an operating frequency of 44 kHz \pm 6% for a period at least 5 minutes.
- ③ After washing with the cleaning solution, all surface areas of the water bottle assembly should be thoroughly rinsed and dried. Use gauze or lint-free cloth to wipe dry most surfaces. Compressed air and 70-90% ethyl or isopropyl alcohol may be used to facilitate drying of hard to reach areas.



STERILIZATION

Before any attempt has been made to sterilize the water bottle assembly, ensure that the cleaning process above has been completed.

CAUTION

- Use only the type of packaging material and package configuration as recommended by the manufacturer of the sterilizer.
- The sterilization parameters are only valid with sterilization equipment that is properly maintained and calibrated. Use appropriate heat process indicators and/or biological monitors as recommended by the manufacturer of the sterilizer.

(1) STEAM STERILIZATION

The OS-H4 water bottle assembly has been designed to withstand high-pressure steam sterilization procedures. Use the parameters below:

Sterilizer Type :	Prevacuum
Temperature :	132 ~ 137°C (270 ~ 279°F)
Time :	5 - 18 minutes

During steam sterilization, ensure that the cap and tubing section have been removed from the water bottle container. Make sure that the drain lever on the water bottle cap is set at A/W position (upright).

Replacing the Lamp

You can install one lamp to use and one spare lamp in the EPK-p.

Check the [1] and [2] indicator lights for [SERVICE] (lamp life indicator) on the front panel before you use the processor. If any of the indicators are lit orange, follow the procedure below to replace the lamp of the corresponding number. The harness for lamp 1 is white and the harness for lamp 2 is black.

⚠ CAUTION

- The average life of the lamp is 50 hours.
- If a lamp goes out, the lamp indicator will illuminate orange and “Please replace the lamp 1 (or lamp 2)” appears on the monitor.

1 Confirm the lamp to be replaced, and align the lamp selection switch to the number of the lamp to be replaced.

2 Press the power switch to turn off the processor and disconnect the power cord.

⚠ CAUTION

Make sure the power cord is disconnected before you replace a lamp.

3 Turn the screw at the top of the lamp housing cover counterclockwise and remove the housing cover. (Refer to Figure 5.3)

⚠ CAUTION

Be sure not to touch any metal part of the lamp because such parts will be hot immediately after the processor is used.

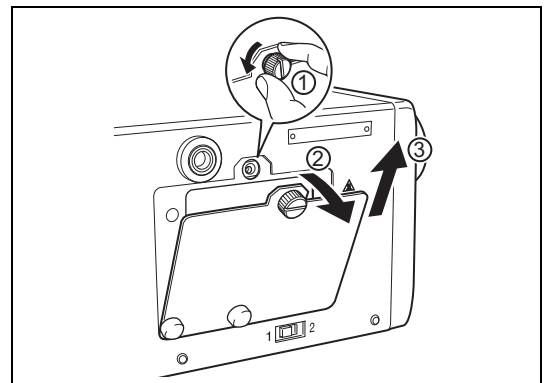


Figure 5.3

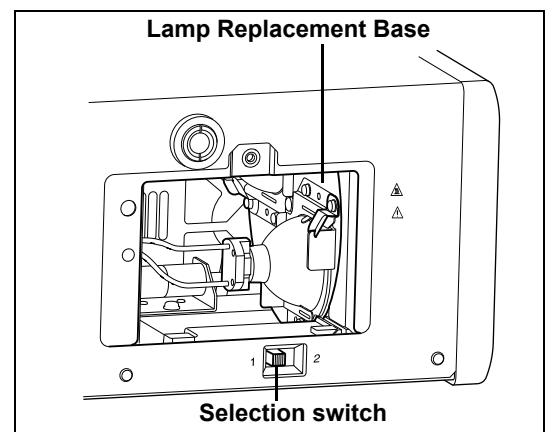
4 Make sure the lamp corresponding to the number of the lamp to be replaced is at the front.

Lamp 1: White harness

Lamp 2: Black harness

⚠ CAUTION

- The lamps can also be switched manually.
- If the lamp corresponding to the number of the lamp to be replaced has not come to the front, rotate the lamp replacement base manually.
- To switch the lamps manually, follow the procedure below.
 - ① Rotate the lamp replacement base while pressing it with a finger.
 - Avoid touching the parts around the lamp immediately after the power is turned off since it may be hot.
 - The rotation direction of the lamp replacement base differs depending on the positions of lamps 1 and 2.
 - When lamp 1 is at the front: turn clockwise
 - When lamp 2 is at the front: turn counterclockwise
 - ② Rotate the lamp replacement base until the lamp corresponding to the number on the lamp you want to replace comes to the front, and the base comes into contact with the stopper.
 - ③ After switching lamps, check that the number on the lamp matches the number selected for the selection switch.



- 5** Unlock the mounting plate first, and then pinch and pull out the slide plate for lamp mounting. (Refer to Figure 5.4)
(If it is difficult to pull out the slide plate for lamp mounting, rotate the lamp replacement base with your fingers and try pulling out the slide plate again.)

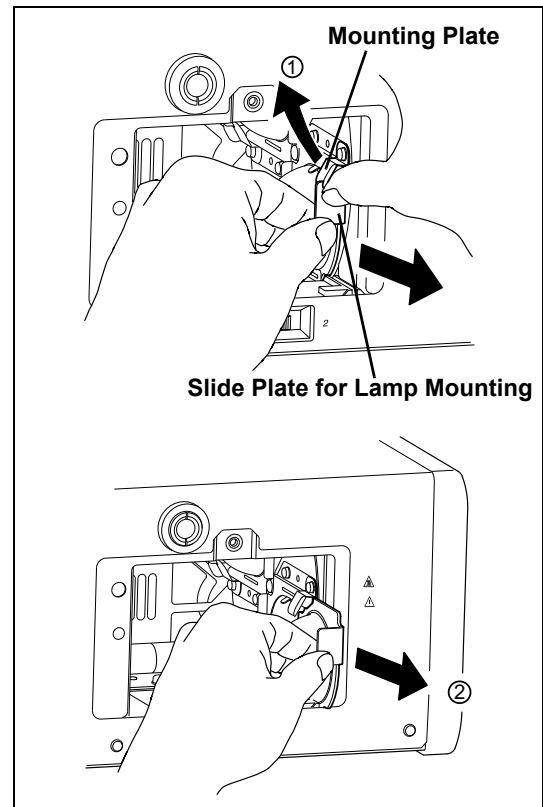


Figure 5.4

- 6** Hold the socket holder and pull it out toward you to remove it from the slide plate for lamp mounting. (Refer to Figure 5.5)

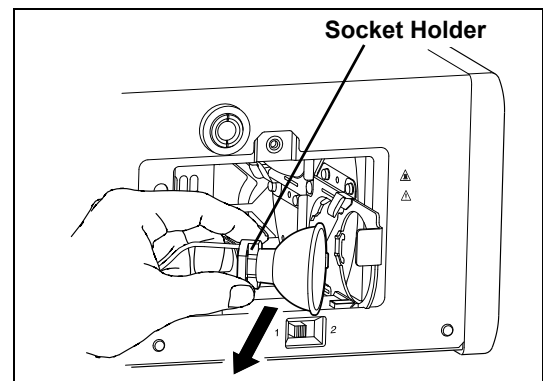


Figure 5.5

- 7** Remove the lamp from the socket holder. (Refer to Figure 5.6)
- 8** Connect a new lamp to the socket holder.
- 9** Insert the socket holder into the slide plate for lamp mounting, and then push in until it is attached.
- 10** Reattach the lamp housing cover and turn the screw at the top of the cover clockwise.

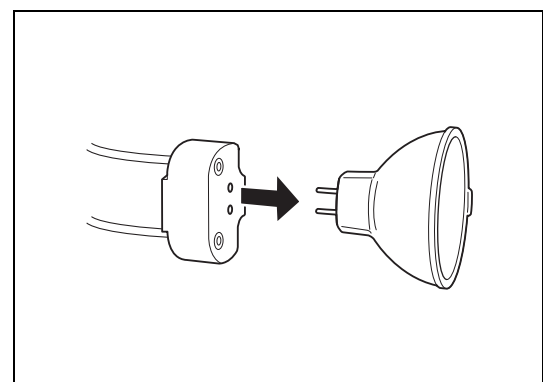


Figure 5.6

CAUTION

- Do not connect a lamp to the wrong connector.
Lamp 1: Connector with the white harness Lamp 2: Connector with the black harness
- If the socket holder is reinserted into the lamp replacement base without connecting the lamp to the socket holder first, it could cause the slide plate for lamp mounting to be damaged or the harnesses to be tangled.

NOTE

- Contact PENTAX with regards to the disposal of lamps.
- Replacement lamps recommended by PENTAX are:
 - OL-H5
- Commercially supplied lamps are:
 - JCR15V150W (USHIO)
 - HLX64634 / 15V150W (OSRAM)
 - 6423FO / 15V150W (PHILIPS)

Replacing the Fuses

If the processor does not work even after you press the power switch to turn on the processor, check whether the fuses have blown.

- 1 Press the power switch to turn off the processor and disconnect the power cord.**
- 2 Insert a screwdriver beneath the fuse box and use it to pull out the fuse box. (Refer to Figure 5.7)**

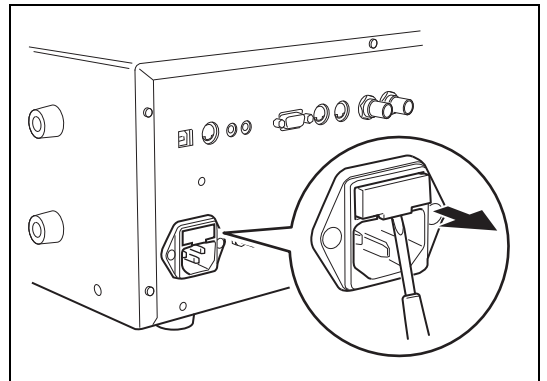


Figure 5.7

- 3 Position the fuse box so that its back is facing you and remove the fuses. (Refer to Figure 5.8)**
- 4 Check both fuses.**
 - If even one fuse has blown, both fuses must be replaced.

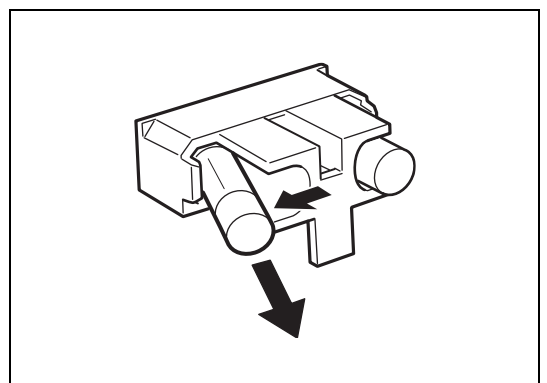


Figure 5.8

NOTE


- When replacing the fuses, be sure to use only specified fuses.
120V (NTSC) $\varnothing 5 \times 20$ 3.15A (time delay)
230V (PAL) $\varnothing 5 \times 20$ 1.6A (time delay)
- If both fuses have not blown, contact our service personnel.

- 5 Reinsert the fuse box.**
- 6 Connect the power cord, press the power switch to turn on the power, and make sure the power indicator light on the front panel illuminates.**

NOTE

If the processor cannot be turned on even after the fuses have been replaced with new ones or a fuse blows again after turning the processor back on, immediately turn off the power, disconnect the power cord, and contact our service personnel.

Before submitting the processor for repair, be sure to perform the after use care procedure in order to prevent infections.

 "After Use Care and Storage" (P.42)

Observe the following points when sending the processor for repair.

- Use appropriate packing to prevent the processor from being broken or damaged during transport.
- Make sure you write down and include details of the malfunction, the processor manufacturing number, your name and contact information, and the destination address.
- Send all accessories that you think may be in any way related to the malfunction together with the processor.

NOTE

- PENTAX is responsible for any repairs it undertakes. Note, however, that PENTAX is in no way liable for any injuries to patients or users, damage or malfunction of the processor, and disinfection or sterilization problems as a result of repairs being undertaken by any party other than PENTAX.
- Be sure to delete any patient data from the processor in order to prevent the disclosure of personal information.



WARNING

Instrument repairs should only be performed by an authorized PENTAX service facility. PENTAX assumes no liability for any patient/user injury, instrument damage or malfunction, or REPROCESSING FAILURE due to repairs made by unauthorized personnel.

It must be recognized that PENTAX does not evaluate non-PENTAX parts, components, materials and/or servicing methods and therefore questions regarding material compatibility and/or functionality of PENTAX instruments built with these unauthorized, untested and unapproved items, materials, repair/assembly methods must be referred to the third party service organization and/or device remanufacturer. It is unknown to PENTAX if serviced or remanufactured instruments (performed by unauthorized PENTAX entities) which still bear a PENTAX label are within PENTAX device specifications and/or if unauthorized activities have significantly changed the instrument's performance, intended use, safety and/or effectiveness.

Ultimately, owners of these medical devices are responsible for selecting an appropriate service facility or vendor whose activities render an instrument to the same expectations and quality of a finished device supplied by the scope OEM.

6 Troubleshooting

Symptom	Cause	Solution	Reference Page
Cannot turn on the processor.	The power cord is not connected properly.	Securely connect the power cord to the power input socket and isolation transformer.	P.15
	A fuse has blown.	Replace the fuses.	P.46
The lamp does not light.	The lamp has burned out.	If any of the [1] and [2] indicator lights for [SERVICE] on the front panel is lit orange, replace the corresponding lamp.	P.44
No image appears on the monitor.	The monitor settings are not configured properly.	Turn on the monitor.	P.16
		Set the proper video input signal.	P.16
		Reset the adjustment values for the monitor.	*1
	A cable is not connected properly.	Connect all cables properly.	P.16
	The scope is not connected properly.	Align the scope locking lever to the LOCK position.	P.18
The lamp is not lit.	Press  on the front panel to turn on the lamp.	P.25	
Images are black and white.	The lamp is not lit.	Press  on the front panel to turn on the lamp.	P.25
Text is not displayed on the monitor or cannot be input.	The keyboard is not connected properly.	Connect the keyboard to the processor properly.	P.17
	The function of the [Character off] key has been activated.	Press the [Character off] key to redisplay all the text information items.	P.39
The scope buttons do not work and the peripheral devices cannot be operated.	The peripheral devices are not connected properly.	Connect the peripheral devices to the processor properly.	P.16 - 17
A long beep tone sounds and the COPY and VTR functions do not work.	The scope switch menu settings are not configured properly or the PC or a peripheral device is not connected properly.	<ol style="list-style-type: none"> ① Change the COPY/VTR function settings in the scope switch menu. Remove the selection for any unused or turned off peripheral device. ② Connect the PC and peripheral devices properly and turn them on. ③ If the capture function is selected and enabled, make sure Image Capture Software (OS-I1) is working properly. 	P.17 P.35
Selecting a lamp with the selection switch does not switch the lamps.	The selection device is broken.	Contact our service personnel immediately. The lamps can be switched manually in an emergency.	P.44

*1: For details, refer to the instruction manual for the monitor.

CAUTION

If there is no response even if you press any key on the keyboard, turn off the processor and contact our service personnel.

NOTE

If there is a problem that cannot be resolved with any of the above solutions, contact our service personnel.

■ Error Messages


Message	Meaning	Solution	Reference Page
Please replace the lamp 1	The lamp is not lit.	Replace lamp 1 or lamp 2.	P.25
Please replace the lamp 2			
Please switch the lamp	The lamp has gone out during use.	Switch to the spare lamp.	P.44
Scope is not Connected	The scope is not attached.	Attach the scope.	P.18
Connected Scope is not Compatible with this Processor Please Contact with your Distributor	The scope is not compatible.	Use a K-series scope.	P.18 P.50
Scope Communication Error	Communication with the scope failed.	Reattach the scope.	P.18
W/B Failed Please Retry	The white balance is incorrect.	Set the white balance again.	P.27
Lamp Error Please close Lamp Door	The lamp housing cover is open.	Close the lamp housing cover.	P.44
Lamp Switching Error	Lamp is not positioned correctly.	Open the lamp housing cover and check the harnesses are attached correctly.	P.44 - 45

7 Specifications

Power Requirements	Voltage	120VAC (NTSC MODEL)	230VAC (PAL MODEL)	
	Frequency	50 - 60 Hz		
	Input current	2.8 A	1.4 A	
	Voltage fluctuation	±10%		
Operating Environment	Ambient temperature	10 - 40°C		
	Relative humidity	30 - 85% (with no condensation)		
	Air pressure	700 - 1060 hPa		
Storage Environment	Ambient temperature	-20 - 60°C		
	Relative humidity	0 - 85% (with no condensation)		
	Air pressure	700 - 1060 hPa		
Illumination	Lamp	150-W twin halogen lamp		
	Average life span	50 h		
	Color temperature	3,400 K		
	Brightness control	Selection: Automatic/Manual		
Scope Compatibility	PENTAX color video endoscopes	This processor can be used with - PENTAX color video endoscopes (K-series) except 30K, 40K, 70CIMK/CIFK/CILK (Confocal Endomicroscopes) and 70UK/UTK/URK (Ultrasound Endoscopes) series		
	PENTAX fiberscopes	NTSC MODEL	PAL MODEL	
Air Feed System	Air pump system	DC Diaphragm		
	Pressure setting at flow rate at 0	45 - 72 KPa (maximum pressure)		
	Standard air feed volume at inlet of water bottle	Low: 2.0 - 4.0 L/min High: 4.1 - 7.0 L/min		
Water Feed System	Water bottle assembly pressurized by pump	Bottle capacity = 250 ml		
Brightness Control System	Automatic	Selection: Average / Peak		
	Manual	±5 step adjustment		
Color System	Color correction	Red/Blue ±5 step adjustment		
Freeze Function		Live video is displayed in a sub-image while freeze mode is activated.		
Cooling		Forced air cooling		
Video Signals	Digital output	SERIAL	1 set	1 set
	Analog output	RGB	1 set	
		Y/C	2 sets	
		Composite	1 set	
	Y	1 set		
Control Signals	Remote	2 sets		
	Keyboard	1 set		
Classification as Electro Medical Equipment	Type of protection against electric shock	Class I equipment, 3 prong plug		
	Degree of protection against electric shock	Type BF (Body Floating), using insulated endoscope. Use on a heart is prohibited.		
	Degree of explosion proofing	Do not use in potentially flammable surroundings.* * The processor is not suitable for use in a mixture of air and flammable anesthetic gas or a mixture of oxygen/nitrous oxide and flammable anesthetic gas.		
Electro Magnetic Compatibility	Designed in accordance with	EN60601-1-2 (2001) + A1 (2006) for EU IEC60601-1-2 (2001) + A1 (2004) for other countries		
Compliance	Designed in accordance with	UL60601-1	IEC60601-1	
Size	Excluding protrusions	Width 380 mm × Height 155 mm × Depth 430 mm		
Weight	Main Body	11.0 kg		

Guidance and manufacturer's declaration-electromagnetic emissions		
The EPK-p is intended for use in the electromagnetic environment specified below. The customer or the user of the EPK-p should assure that it is used in such an environment.		
Emissions test	Compliance	Electromagnetic environment-guidance
RF emissions CISPR 11	Group 1	The EPK-p uses RF energy only for its internal function. Therefore, its RF emissions are very low and are not likely to cause any interference in nearby electronic equipment. The EPK-p is suitable for use in all establishments, including domestic establishments and those directly connected to the public low-voltage power supply network that supplies buildings used for domestic purposes.
RF emissions CISPR 11	Class B	
Harmonic emissions IEC 61000-3-2	Class A	
Voltage fluctuations/ flicker emissions IEC 61000-3-3	Complies	

Guidance and manufacturer's declaration-electromagnetic immunity			
The EPK-p is intended for use in the electromagnetic environment specified below. The customer or the user of the EPK-p should assure that it is used in such an environment.			
Immunity test	IEC 60601 test level	Compliance level	Electromagnetic environment-guidance
Electrostatic discharge (ESD) IEC 61000-4-2	$\pm(2, 4, 6)$ kV contact $\pm(2, 4, 8)$ kV air	$\pm(2, 4, 6)$ kV contact $\pm(2, 4, 8)$ kV air	Floors should be wood, concrete or ceramic tile, if floors are covered with synthetic material, the relative humidity should be at least 30 %.
Electrical fast transient/burst IEC 61000-4-4	± 2 kV for power supply lines ± 1 kV for signal lines	± 2 kV for power supply lines ± 1 kV for signal lines	Mains power quality should be that of a typical commercial or hospital environment.
Surge IEC 61000-4-5	± 1 kV differential mode ± 2 kV common mode	± 1 kV differential mode ± 2 kV common mode	Mains power quality should be that of a typical commercial or hospital environment.
Voltage dips, short interruptions and voltage variations on power supply input lines IEC 61000-4-11	5 % <i>UT</i> (>95 % dip in <i>UT</i>) for 0.5 cycle 40 % <i>UT</i> (60 % dip in <i>UT</i>) for 5 cycles 70 % <i>UT</i> (30 % dip in <i>UT</i>) for 25 cycles <5 % <i>UT</i> (>95 % dip in <i>UT</i>) for 5 sec	<5 % <i>UT</i> (>95 % dip in <i>UT</i>) for 0.5 cycle 40 % <i>UT</i> (60 % dip in <i>UT</i>) for 5 cycles 70 % <i>UT</i> (30 % dip in <i>UT</i>) for 25 cycles <5 % <i>UT</i> (>95 % dip in <i>UT</i>) for 5 sec	Mains power quality should be that of a typical commercial or hospital environment, if the user of the EPK-p requires continued operation during power mains interruptions, it is recommended that the EPK-p be powered from an uninterruptible power supply.
Power frequency (50/60 Hz) magnetic field IEC 61000-4-8	3A/m	3A/m	Power frequency magnetic fields should be at levels characteristic of a typical location in a typical commercial or hospital environment.
NOTE <i>UT</i> is the a.c. mains voltage prior to application of the test level.			

Guidance and manufacturer's declaration-electromagnetic immunity			
The EPK-p is intended for use in the electromagnetic environment specified below. The customer or the user of the EPK-p should assure that it is used in such an environment.			
Immunity test	IEC 60601 test level	Compliance level	Electromagnetic environment-guidance
Conducted RF IEC 61000-4-6	3 Vrms 150 kHz to 80 MHz	3 Vrms	<p>Portable and mobile RF communications equipment should be used no closer to any part of the EPK-p, including cables, than the recommended separation distance calculated from the equation applicable to the frequency of the transmitter.</p> <p>Recommended separation distance</p> $d = 1.2 \sqrt{P}$ $d = 1.2 \sqrt{P} \quad 80 \text{ MHz to } 800 \text{ MHz}$ $d = 2.3 \sqrt{P} \quad 800 \text{ MHz to } 2.5 \text{ GHz}$ <p>where P is the maximum output power rating of the transmitter in watts (W) according to the transmitter manufacturer and d is the recommended separation distance in meters (m).</p> <p>Field strengths from fixed RF transmitters, as determined by an electromagnetic site survey, should be less than the compliance level in each frequency range.</p> <p>Interference may occur in the vicinity of equipment marked with the following symbol:</p> 
Radiated RF IEC 61000-4-3	3 V/m 80 MHz to 2.5 GHz	3 V/m	
<p>NOTE1 At 80 MHz and 800 MHz, the higher frequency range applies.</p> <p>NOTE2 These guidelines may not apply in all situations. Electromagnetic propagation is affected by absorption and reflection from structures, objects and people.</p>			
<p>^a Field strengths from fixed transmitters, such as base stations for radio (cellular/cordless) telephones and land mobile radios, amateur radio, AM and FM radio broadcast and TV broadcast cannot be predicted theoretically with accuracy. To assess the electromagnetic environment due to fixed RF transmitters, an electromagnetic site survey should be considered. If the measured field strength in the location in which the EPK-p is used exceeds the applicable RF compliance level above, the EPK-p should be observed to verify normal operation. If abnormal performance is observed, additional measures may be necessary such as reorienting or relocating the EPK-p.</p>			
<p>^b Over the frequency range 150 kHz to 80 MHz, field strengths should be less than 3 V/m.</p>			

**Recommended separation distances between
portable and mobile RF communications equipment and the EPK-p**

The EPK-p is intended for use in the electromagnetic environment in which radiated RF disturbances are controlled. The customer or the user of the EPK-p can help prevent electromagnetic interference by maintaining a minimum distance between portable and mobile RF communications equipment (transmitters) and the EPK-p as recommended below, according to the maximum output power of the communications equipment.

Rated maximum output power of transmitter W	Separation distance according to frequency of transmitter m		
	150 kHz to 80 MHz $d = 1.2 \sqrt{P}$	80 MHz to 800 MHz $d = 1.2 \sqrt{P}$	800 MHz to 2.5 GHz $d = 2.3 \sqrt{P}$
0.01	0.12 m	0.12 m	0.23 m
0.1	0.38 m	0.38 m	0.73 m
1	1.2 m	1.2 m	2.3 m
10	3.8 m	3.8 m	7.3 m
100	12 m	12 m	23 m

For transmitters rated at a maximum output power not listed above, the recommended separation distance d in meters (m) can be estimated using the equation applicable to the frequency of the transmitter, where P is the maximum output power rating of the transmitter in watts (W) according to the transmitter manufacturer.

NOTE 1 At 80 MHz and 800 MHz, the separation distance for the higher frequency range applies.

NOTE 2 These guidelines may not apply in all situations. Electromagnetic propagation is affected by absorption and reflection from structures, objects and people..

Default Settings

Item		Default Setting			
Set Up	Date & Time	Format	120VAC (NTSC) MM/DD/YY 230VAC (PAL) DD/MM/YY		
	Lamp		Off		
	Scope Button 1	Mode	Freeze		
	Scope Button 2	Mode	Trigger	Remote 1	On
				Remote 2	On
				SERIAL	Off
				Freeze Mode	Release
	Scope Button 3	Mode	Zoom		
	Scope Button 4	Mode	Ave/Peak		
	Remote Function	Remote 1	Pulse		
		Remote 2	Pulse		
Film Counter		F1 to 99			
Zoom		1.2/1.5/2.0			
Display	Image Size		Normal		
	Sub Image		Upper Right		
	Image Direction		Normal		
	Display	Display	SCOPE	Off	
			PENTAX	Off	
			Film Counter	On	
			Name	On	
			ID	On	
			AGE	On	
			SEX	On	
			DR.	On	
			Facility	On	
			Comment	On	
DATE	On				
TIME	On				
Process	Noise Reduction		Off		
	Contrast		Normal		
	Zoom		Off		
	Film Counter Reset		1		
Other	Input Data	Patient Information	NAME		
			ID		
			AGE		
			SEX		
			Comment		
	System Settings	User Information	Facility	DR.	
				Measuring Mode	Averaging
				Red	0
				Blue	0
				Brightness	0
Beep tone		Alphabet off			

MEMO

NOTICE

This equipment is a Class B Medical Equipment (specified EN55011) and is intended for hospital or health care districts.

When used in clinical or residential areas near radio and TV receiver units, this equipment may be subjected to radio interference.

To reduce electromagnetic interference, do NOT keep turning ON the main POWER SWITCH of the equipment while a videoscope is connected but not ready for use.

To avoid and resolve adverse electromagnetic effects, do NOT operate this equipment near the RF energy equipment.

Only connection cables and keyboard specified by PENTAX conform to the above standards.

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* Specifications are subject to change without notice and without any obligation on the part of the manufacturer.



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