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Warnings and Cautions

Please read this manual and follow its instructions carefully. The words **warning**, **caution**, and **note** carry special meanings and should be carefully reviewed:

Warning 	The personal safety of the patient or physician may be involved. Disregarding this information could result in injury to the patient or physician.
Warning 	A lightning bolt within a triangle is intended to warn of the presence of hazardous voltage. Refer all service to authorized personnel.
Caution	Special service procedures or precautions must be followed to avoid damaging the instrument.
Note	Special information to make maintenance easier or important information more clear.

Warnings

- Warning**  **To avoid potential serious injury to the user and the patient, and/or damage to this device, the user must:**
1. Restrict this device to use by, or on the order of, a physician, because of Federal law (United States of America).
 2. Read the operating manual thoroughly and be familiar with its contents prior to using this equipment.
 3. Carefully unpack the unit and check if any damage occurred during shipment.
 4. Test this equipment prior to a surgical procedure. This monitor was fully tested at the factory before shipment.
 5. Do not place the monitor or any other heavy object on the power cord. Damage to the cable can cause fire or electric shock.
 6. Should any solid object or liquid fall into the panel, unplug the unit and have it checked by qualified personnel before operating it any further.
 7. Unplug the unit if it is not to be used for an extended period of time. To disconnect the cord, pull it out by the plug. Never pull the cord itself.

8. To avoid electric shock, avoid removing control unit covers.
9. Do not attempt internal repairs or adjustments not specifically detailed in this operating manual.
10. Pay close attention to the care and cleaning instructions in this manual. A deviation may cause damage (refer to the Cleaning section).
11. Do not sterilize the monitor.
12. Use appropriate caution to prevent contact with fluids, if the unit is being used with a power supply in patient environments.

Cautions

1. The AC Adapter must be plugged into a grounded power outlet.
2. Use only the proprietary VISION ELECT HDTV(model 240-030-960) power supply (P/N 240 -030-950, Manufacturer: JEC Korea, Model No: JMW1150KA2400F07) for the VISION ELECT HDTV (model 240-030-960) monitor.
3. Grounding reliability can only be achieved when the equipment is connected to an equipment receptacle labeled "Hospital Only" or "Hospital Grade."
4. To connect to an international power supply, use an attachment plug appropriate for the power outlet.
5. Turn power off when unit is not in use.
6. Remove the power module and connection when transporting the unit.
7. Save the original carton and associated packing material. They will be useful should you have to transport or ship the unit.
8. Handle the monitor with care. Do not strike or scratch the screen.
9. Never operate the unit right after having been transported from a cold location directly to a warm location.
10. Do not expose the monitor to moisture or directly apply liquid cleaners directly to the screen. Spray the cleaning solution into a soft cloth and clean gently.
11. Allow adequate air circulation to prevent internal heat buildup.
12. Do not place the unit on surfaces (rugs, blankets, etc.) or near materials (curtains, draperies) that may block the ventilation slots. The monitor is cooled by natural convection and has no fan.
13. Do not install the unit near sunlight, excessive dust, mechanical vibration or shock.

14. The unit is designed for operation in a horizontal position. Do not operate the unit in a vertical position.
15. Keep the unit away from equipment that uses strong magnets (i.e., large loudspeakers).
16. Do not touch the patient with signal input or output connectors. Equipment with SIP/SOP connectors should either comply with IEC 60601-1 and/or IEC 60601-1-1 harmonized national standards or the combination should be evaluated.
17. CAUTION: Changes or modifications not expressly approved by the party responsible for compliance could void the user's authority to operate the equipment.

Note This equipment has been tested and found to comply with the limit for a Class B digital device, pursuant to Part 15 of the FCC Rules. These limits are designed to provide reasonable protection against harmful interference in a residential installation. This equipment generates, uses and can radiate radio frequency energy and, if not installed and used in accordance with the instructions, may cause harmful interference to radio communications. There is no guarantee that interference will not occur in a particular installation, which can be determined by turning the equipment off and on. The user is encouraged to try to correct the interference by one or more of the following measures:

- Reorient or relocate the receiving device.
- Increase the separation distance between the equipment.
- Connect the equipment to an outlet on a circuit different from that to which the other device(s) are connected.
- Consult the manufacturer or field service technician for help.



















18. To ensure electromagnetic compatibility, refer to the "Electromagnetic Compatibility" section of this manual. The VISION ELECT HDTV (model 240-030-960) monitor must be installed and operated according to the EMC information provided in this manual.

The VISION ELECT HDTV (model 240-030-960) monitor has been tested under the UL 60601-1 standard and is UL listed for medical application.

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

Symbol Definitions

The following symbols appear on the product, its labeling, or the product packaging. Each symbol carries a special definition, as defined below

	Dangerous: High Voltage
	Consult accompanying documents.
	Direct Current
	Indicates protective earth ground.
	For indoor use only.
	DC power control switch
SN	Serial Number
	Top - Bottom
	Fragile
	Do not get wet
	Maximum Stacking
	Manufacturer
	European Authorized Representative
	Indicates proof of conformity to applicable European Economic Community Council directives and to harmonized standards published in the official journal of the European Communities.
 51LJ Medical Equipment E215822	Medical Equipment is in accordance with UL 60601-1 and CAN/CSA C22.2 No. 601.1 in regards to electric shock, fire hazards, and mechanical hazards.
	Tested to comply with FCC Class B standards.
	Degrees of protection against the ingress of water.
	This symbol indicates that the waste of electrical and electronic equipment must not be disposed as unsorted municipal waste and must be collected separately. Please contact the manufacturer or other authorized disposal company to decommission your equipment.
	DC power on at locker switch

Product Description and Intended Use

The VISION ELECT HDTV (model 240-030-960) High Definition LCD Monitor is an intelligent, microprocessor-based TFT-LCD monitor intended for use in endoscopic surgical applications. It has an ergonomically designed display and is compatible with most analog RGB (Red, Green, Blue) display standards.

The VISION ELECT HDTV (model 240-030-960) monitor has the following features:

- Advanced Viewing Solution (AVS): A sophisticated filter extends the viewing angle of the screen image, without sacrificing contrast ratio and brightness.
- Upgraded video cards or software will not require buying a new monitor because of the wide auto-scanning compatibility range.
- The internal microprocessor digitally controls auto-scanning, for horizontal scan frequencies between 31.47 KHz and 78.88 KHz, and vertical scan frequencies between 50.0 Hz and 85.1 Hz. In each frequency mode, the microprocessor-based circuitry allows the monitor to function at the precision of a fixed frequency.
- The resident memory allows for storing factory default settings and also additional user adjustment parameters.
- The maximum resolution achievable is WUXGA (1920 x 1200, 60Hz), best suited for Stryker cameras.
- The monitor is compliant with the VESA-DPMS power-management standard. In order to save energy, the monitor must be connected to a system compliant with the standard.
- The monitor is designed to mount an accessory (such as a camera or speaker) with a 2 lbs (max) load per hole.
- The monitor is certified by UL International in accordance with medical standard UL 60601-1. It is also CE marked for sale in the European Community for integration or use with medical products.

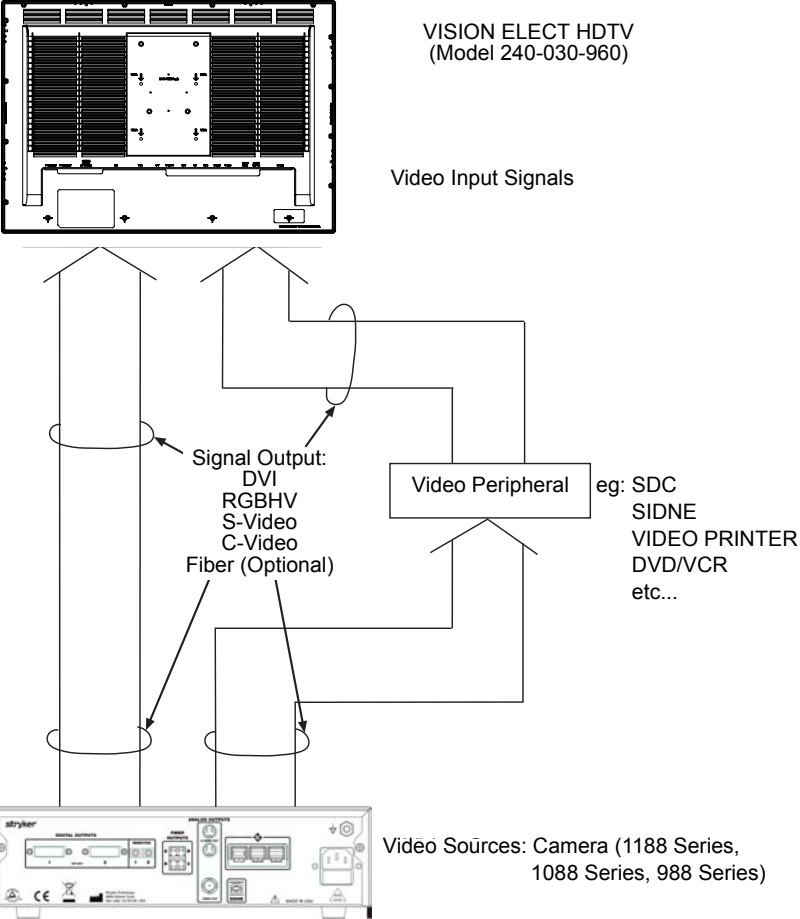
Product Contents

1. Carefully unpack the VISION ELECT HDTV (model 240-030-960) monitor. Save the original carton and associated packing material. They will be useful should you have to transport or ship the unit.

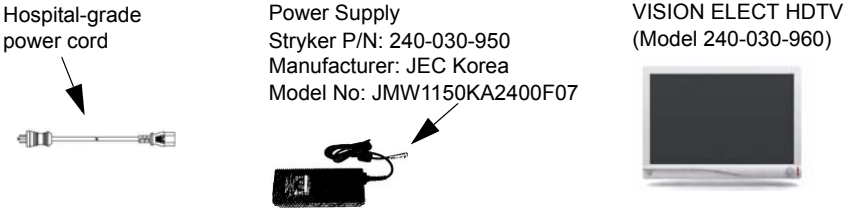
2. Check the monitor and its accessories for any damage that may have occurred during shipping. Immediately report any damage to the shipping company.
3. Check the contents of the accessories package with the following list to make sure all components have been included. In addition to this manual, you should find:
 - (a) 1 DVI cable
 - (b) 1 VGA HDDB15 cable
 - (c) 1 AC adapter (Stryker P/N 240-030-950, Manufacturer: JEC Korea, Model No: JMW1150KA2400F07)
 - (d) 1 Hospital-grade AC power cord
 - (e) 4 M4 x 10mm VESA screws (not shown)
 - (f) 1 BNC cable
 - (g) 1 S-Video cable



System Interconnection



Power Connection



Operating the Monitor

Front Panel Controls

Operate the monitor using the rotary control located on the front panel. A list of the monitor controls and their functions is provided below.



Figure 1: The VISION ELECT HDTV LCD Monitor front panel controls.

1. **Power LED:** Indicates menu current status. Displays green if monitor is powered on, blinks orange if monitor is in Standby mode.
2. **Power Switch:** Turns the power ON or OFF.
3. **Rotary Control (Turn Right):** With the on-screen display menu activated, increases the value of the selected parameter. With the on-screen display deactivated, activates the video source selection menu.
4. **Rotary Control (Turn Left):** With the on-screen display menu activated, decreases the value of the selected parameter. With the on-screen display deactivated, activates the video source selection menu.
5. **Rotary Control Switch (Push):** Accesses/selects on-screen display menu.
6. **Rotary Control Switch (Push and Hold):** Exits on-screen display menu.

Standard On-Screen Display (OSD) Operation

The monitor provides an on-screen display to help navigate through the various monitor-adjustment menus.

1. Press the Rotary Control to activate the on-screen display (OSD) menu.
2. Rotate the Rotary Control to move up or down through the menu. The parameter will be highlighted when selected.
3. Press the Rotary Control to enter the next level OSD.
4. Rotate the Rotary Control to increase or decrease the value of the selected parameter, or to make a selection on different options.
5. To exit the OSD menu screen from the second- or third-level OSD menu, select the Exit option. To completely exit the OSD, press and hold the rotary control. If no keys are pressed for a time period, the OSD automatically times out.
6. While the OSD menu is deactivated, rotate the Rotary Control to activate the input signal selection menu. The current input signal will be highlighted with a dot. Rotate the rotary control to select the preferred input signal.

Stryker Camera Preset Modes

Camera	Resolution (H x V)	Horizontal Frequency (KHz)	Vertical Frequency (Hz)
988	1024 x 768	49.09	59.90
988i	1024 x 768	41.25	50.00
1088/SDC Pro2	1024 x 768	50.03	60.00
1088i/SDC Pro2	1024 x 768	41.10	50.00
1088/1188/SDC HD	1280 x 1024	64.02	60.10
1088i/1188i/SDC HD	1280 x 1024	59.99	50.00

OSD Function Description

Item	Function Description	Range
Specialty		
Color Temperature RGB adjustment is available only for Standard, Arth and Lap settings)	Choose between color temperatures for Standard, Arth, Lap, PACS, or Norm	
Red	Red balance	-128-128
Green	Green balance	-128-128
Blue	Blue balance	-128-128
Gamma	Gamma value	0.1-2.5
Setting		
Brightness	Increase or decrease the brightness	0-100
Contrast	Increase or decrease the contrast	0-100
Phase*	Increase or decrease the Phase level	0-100
Chroma*	Increase or decrease the Chroma level	0-100
Image Sharpness	Set image sharpness	1-10
Video Sharpness*	Increase or decrease the video sharpness	1-4
Image Effect		
Scale Mode	Choose scale mode between Fill all, V-fill, H-fill, or one to one	
Mirror	Enable or Disable mirror image	
Freeze Frame	Enable or Disable freeze frame	
Zoom/Pan	Enable zoom-in and pan function	
PIP/POP	Enable PIP/POP (Picture In Picture/Picture On Picture) function	
PBP	Enable PBP (Picture By Picture) function	
Advanced		
OSD position Control	Control OSD Menu Position, Background, and Timeout	
Screen Control**	Control and adjust Horizontal, Vertical, Frequency, Phase	
DPMS	Choose DPMS (Display Power Management Signaling)	
Auto Source Select	Adjust Auto Source Select between on and off	
Restore Factory Settings	Set to factory default	
Key lock	Set to Key lock mode	
Information		
User Name Entry	Enter custom username display for boot-up display	
Serial Number	Display monitor serial number	
Runtime	Display current run time of monitor	
Input Format	Display current input format	

Actual on-screen display values may vary with updated versions of the firmware and user setting.

* Only available under S or C video input.

** Only available under VGA input.

Cleaning the Monitor

No specific liquid or chemical is necessary for cleaning this VISION ELECT HDTV (model 240-030-960) LCD monitor. We suggest to clean the monitor with non-abrasive cloths and cleaning solutions used in hospitals to clean similar equipment. We recommend using 70% Isopropyl alcohol for the screen surface and warm water and a mild detergent for all other surfaces. Other acceptable cleaning agents are listed below:

- 70% isopropyl alcohol
- Cidex (2.4% glutaraldehyde solution)
- 0.5% Chlorhexidine in 70% isopropyl alcohol

To clean the screen, do not spray liquid cleaners directly on to the unit. Stand away from the monitor and spray cleaning solution onto a cloth. Without applying excessive pressure, clean the screen with the slightly dampened rag.

Troubleshooting

Before returning your LCD monitor for service, consult the troubleshooting list below

Problem	Current Status	Remedy
No Picture	LED ON	Using the OSD, adjust the brightness and contrast to maximum, or reset them to their default settings.
	LED OFF	Check the power switch.
		Check if the AC power cord is properly connected to the AC adapter.
LED Blinking	Check if the video signal cable is properly connected at the back of the monitor.	
	Check if the power to the computer system is ON.	
Abnormal Picture	Oversized or undersized display; missing display; center shift	Using the Auto Setup button, adjust CLOCK, CLOCK-PHASE, H-POSITION, and V-POSITION with non-standard signals.
		Wait for a few seconds after adjusting the size of the image before changing or disconnecting the signal or powering OFF the monitor.

Technical Specifications

Display

LCD Monitor Panel	25.54 inches (a-Si TFT Active matrix LCD)
Synchronization	2.5 - 5.0 Vpp separated sync
Pixel Pitch	0.2865(W) x 0.2865(H)
Response Time	<25ms Typ
View Angle	+/-89° (L/R) x +/-89° (U/D)
Display Colors	16 million colors
Native Resolution	1920 dots x 1200 dots
Input Signal	1 x DVI 1 x VGA 1 x SDI 1 x C-Video/SOG 1 x S-Video 1 x Component (Y/G, Pb/B, Pr/R, H/CS, VS) 1 x Optical
Maximum Pixel Clock	170MHz

Electrical

Power Adapter	AC 100-240V; DC 24V
Power Consumption	150 (max)
Current	Direct

Dimensions (Free Stand)

Dimensions (W x H x D)	616.4 x 428.8 x 121.2mm
Weight	19.62lbs
VESA Mounting Interface	VESA 100 x 100mm



Operating Conditions

Operating Temperature	41 to 90°F (5 to 32.2°C)
Relative Humidity	10 to 60%
Atmospheric Pressure Range	500 to 1060 hPa
Electrical Input Rating	24V DC 6.25A

Transport & Storage Conditions

Storage	-4 to 140°F (-20 to 60°C)
Relative Humidity Range	10 to 85%
Atmospheric Pressure Range	500 to 1060 hPa

Classification and Approvals

	: Direct Current
	: UL approval mark according to the safety standard for Medical equipment

Class I Equipment

Medical equipment with respect to electric shock, fire and mechanical hazards only in accordance with UL 60601-1 and CAN/CSA C22.2 No. 601.1.

IPX1 Water Ingress Protection

Continuous operation

Warning **This equipment is not suitable for use in the presence of a FLAMMABLE ANESTHETIC MIXTURE WITH AIR, or WITH OXYGEN OR NITROUS OXIDE.**

This monitor is intended for use on Health Care Facilities model --.

No user serviceable parts inside. Ask qualified personnel before accessing internal components.

Caution **For disposal of waste product, follow the requirement of the local code.**


This product is considered electronic equipment. It must not be disposed of as unsorted municipal waste, and must be collected separately. Please contact the manufacturer or other authorized disposal company to decommission your equipment.


Electromagnetic Compatibility


Like other electrical medical equipment, the VISION ELECT HDTV (model 240-030-960) monitor requires special precautions to ensure electromagnetic compatibility with other electrical medical devices. To ensure electromagnetic compatibility (EMC), the VISION ELECT HDTV (model 240-030-960) monitor must be installed and operated according to the EMC information provided in this manual.

Note The VISION ELECT HDTV (model 240-030-960) monitor has been designed and tested to comply with IEC 60601-1-2:2003 requirements for EMC with other devices.

Caution **The VISION ELECT HDTV (model 240-030-960) monitor may be interfered with by other equipment, including portable and mobile RF communication equipment, even if such equipment meets the applicable emissions requirements.**


Warning
 **Do not use cables or accessories other than those provided with the VISION ELECT HDTV (model 240-030-960) monitor, as this may result in increased electromagnetic emissions or decreased immunity to such emissions.**

Warning
 **If the VISION ELECT HDTV (model 240-030-960) monitor is used adjacent to or stacked with other equipment, observe and verify normal operation of the VISION ELECT HDTV (model 240-030-960) monitor in the configuration in which it will be used prior to using it in a surgical procedure. Consult the tables below for guidance in placing the VISION ELECT HDTV (model 240-030-960) monitor**

Warning
 **When this device is connected with other electrical equipment, leakage currents may be additive. To minimize total leakage current per patient, ensure that all systems are installed according to the requirements of IEC 60601-1-1.**

Manufacturer's declaration - electromagnetic emissions		
VISION ELECT HDTV (model 240-030-960) monitor is intended for use in the electromagnetic environment specified below. The customer or the user of VISION ELECT HDTV (model 240-030-960) monitor should assure that it is used in such an environment.		
Emissions test	Compliance	Electromagnetic Environment - guidance
RF emissions CISPR11	Group 1	The VISION ELECT HDTV (model 240-030-960) monitor must emit electromagnetic energy in order to perform its intended function. Nearby electronic equipment may be affected.
RF emissions CISPR11	Class B	VISION ELECT HDTV (model 240-030-960) monitor 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.
Harmonic emissions IEC61000-3-2	Class D	
Voltage Fluctuations/ flicker emissions IEC61000-3-3	Complies	

Manufacturer's declaration - electromagnetic immunity			
VISION ELECT HDTV (model 240-030-960) monitor is intended for use in the electromagnetic environment specified below. The customer or the user of VISION ELECT HDTV (model 240-030-960) monitor should assure that it is used in such an environment.			
Immunity Test	IEC 60601 Test Level	Compliance Level	Electromagnetic environment - guidance
Electrostatic Discharge (ESD) IEC61000-4-2	6kV contact 8kV air	6kV contact 8kV 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 IEC61000-4-4	2kV for power supply lines 1kV for input/output lines	2kV for power supply lines 1kV for input/output lines	Mains power quality should be that of a typical commercial or hospital environment.
Surge IEC61000-4-5	1kV differential mode 2kV common mode	1kV differential mode 2kV common mode	Mains power quality should be that of a typical commercial or hospital environment.
Power frequency (50/60Hz) magnetic field IEC 61000-4-8	3.0 A/m	3.0 A/m	Power frequency magnetic fields should be at levels characteristic of a typical location in a typical commercial or hospital environment.
Voltage dips, short interruptions and voltage variations on power supply input lines IEC61000-4-11	<5% Ut (>95% dip in Ut) for 0.5 cycle 40% Ut (60% dip in Ut) for 5 cycles 70% Ut (30% dip in Ut) for 25 cycles <5% Ut (>95% dip in Ut) for 5 sec.	<5% Ut (>95% dip in Ut) for 0.5 cycle 40% Ut (60% dip in Ut) for 5 cycles 70% Ut (30% dip in Ut) for 25 cycles <5% Ut (>95% dip in Ut) for 5 sec.	Mains power quality should be that of a typical commercial or hospital environment. If the user of VISION ELECT HDTV (model 240-030-960) image intensifier requires continued operation during power mains interruptions, it is recommended that VISION ELECT HDTV (model 240-030-960) image intensifier be powered from an uninterruptible power supply or a battery.
NOTE: Ut is the A.C. mains voltage prior to application of the test level.			

Manufacturer's declaration - electromagnetic immunity			
VISION ELECT HDTV (model 240-030-960) monitor is intended for use in the electromagnetic environment specified below. The customer or the user of VISION ELECT HDTV (model 240-030-960) monitor should ensure that it is used in such an environment.			
Immunity Test	IEC 60601 Test Level	Compliance Level	Electromagnetic Environment: Guidance
			Portable and mobile RF communications equipment should be used no closer to any part of the VISION ELECT HDTV (model 240-030-960) monitor system, including cables, than the recommended separation distance calculated from the equation applicable to the frequency of the transmitter.
Conducted RF IEC 61000-4-6	3 Vrms 150 kHz to 80 MHz	3 V	Recommended Separation Distance $d = 1.17\sqrt{P}$
Radiated RF IEC 61000-4-3	3 V/m 80MHz to 2.5 GHz	3 V/m	
			$d = 1.17\sqrt{P}$ 80 MHz to 800 MHz $d = 2.33\sqrt{P}$ 800 MHz to 2.5 GHz 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). Field strengths from fixed RF transmitters, as determined by an electromagnetic site survey ^(a) , should be less than the compliance level in each frequency range ^(b) . Interference may occur in the vicinity of equipment marked with the following symbol: 
NOTE 1: At 80 MHz and 800 MHz, 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.			
<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 VISION ELECT HDTV (model 240-030-960) monitor system is used exceeds the applicable RF compliance level above, the VISION ELECT HDTV (model 240-030-960) monitor system should be observed to verify normal operation. If abnormal performance is observed, additional measures may be necessary, such as reorienting or relocating the VISION ELECT HDTV (model 240-030-960) monitor unit.</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 VISION ELECT HDTV (model 240-030-960) monitor System			
The VISION ELECT HDTV (model 240-030-960) monitor system is intended for use in an electromagnetic environment in which radiated RF disturbances are controlled. The user of the VISION ELECT HDTV (model 240-030-960) monitor system can help prevent electromagnetic interference by maintaining a minimum distance between portable and mobile RF communications equipment (transmitters) and the VISION ELECT HDTV (model 240-030-960) monitor system as recommended below, according to the maximum output power of the communications equipment.			
Rated maximum output power (W) of transmitter	Separation distance (m) according to frequency of transmitter		
	150 kHz to 80 MHz $d = 1.17 \sqrt{P}$	80 MHz to 800 MHz $d = 1.17 \sqrt{P}$	800 MHz to 2.5 GHz $d = 2.33 \sqrt{P}$
0.01	0.12	0.12	0.23
0.1	0.37	0.37	0.74
1	1.17	1.17	2.33
10	3.70	3.70	7.37
100	11.70	11.70	23.30
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.			

Dimension Drawing (mm)

