

Nuvo Surgical Video Display System

Model V1360A USER MANUAL



**For Parts or Technical Assistance
USA and CANADA (800) 663-1152
INTERNATIONAL (814) 899-422**

Table of Contents

Intended Use	3
Product Overview	4
Surgical Monitor Positioning	5
Instructions for Use	6
To Turn the Monitor On/Off	6
To Connect a Video Source to the Video Display System	7
To Connect the Video Display System to a Display or Recording Device	8
To Select a Video Signal for Display at a Monitor Using the Wall Control	9
To Select a Video Signal for Display at a Monitor Using the Monitor Handle	10
To Remove the Sterile Handle and Reinstall	11
To Adjust the Monitor Image	11
Maintenance	12
Cleaning	12
Sterilization	12
Sterilizable Handle	13
Using Optional Sterile Handle Covers	13
Preventive Maintenance	14
Consumable Parts	14
Troubleshooting	15
Nuvo Video Display System Specifications	16
Dimensions	16
Monitor Specifications	16
Environmental Conditions for Transport and Storage	17
Environmental Conditions for Use	17
Mains Power Requirements	17
Vertical Load Characteristics	17
Moment Load Characteristics	17

Intended Use

The Nuvo Video Display System

The Nuvo Surgical Monitor is intended to be used primarily by a surgeon to view images generated by an endoscopic camera.

Introduction

This manual provides the information required for normal operation of the Nuvo Video Display System. Before operating the Nuvo Surgical Monitor, be sure that you have read and understand the contents of this manual. It is important that you read and strictly adhere to the aspects of safety contained in these manuals.

Where applicable, this manual is intended to supplement the Nuvo Surgical Light User Manual S2Z00125.



WARNING:

It is recommended that a complete back-up display system be available at all times in case of a total system failure.



CAUTION:

It is strongly recommended the user verify the video system operation before beginning any procedure.



WARNING:

Do not use the Nuvo Video Display System for radiology diagnosis. Radiographic images are displayed for reference only. Possible misdiagnosis of the patient could occur.



WARNING:

Equipment which is not medical grade, but connected to the system, should be kept out of the patient vicinity. Failure to do so could result in personal injury or equipment damage.

Nuvo Surgical Monitor Product Overview

Positioning

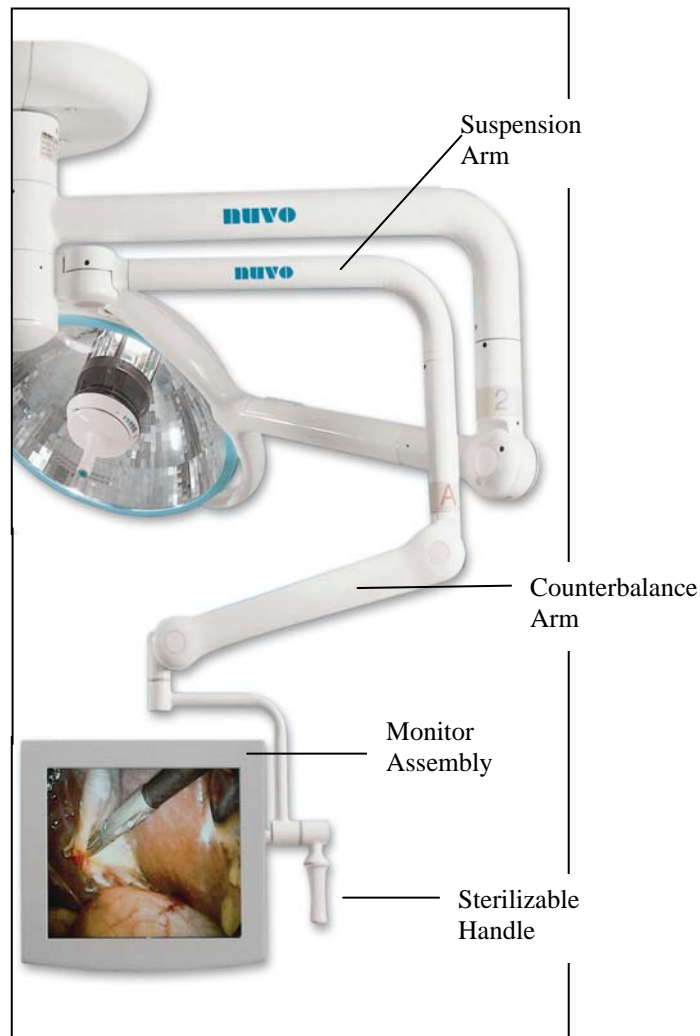
- Vertical axis rotates 300°
- Monitor rotates 300°
- Drift-resistant positioning
- Minimal airflow disturbance
- Stows out of the way
- Single or dual monitor mounts

Monitor Features

- 19" flat-screen medical grade Liquid Crystal Display
- Up to four input channels (with optional switching system)
- Wall-mounted input/output selector (with optional switching system)

Maintenance Features

- Easily sterilized positioning handle
- Wires and connectors concealed for cleaning ease



Surgical Monitor Positioning

The Nuvo Surgical Monitor system provides the surgeon with a suspension arrangement that is well balanced and can be guided easily into position.

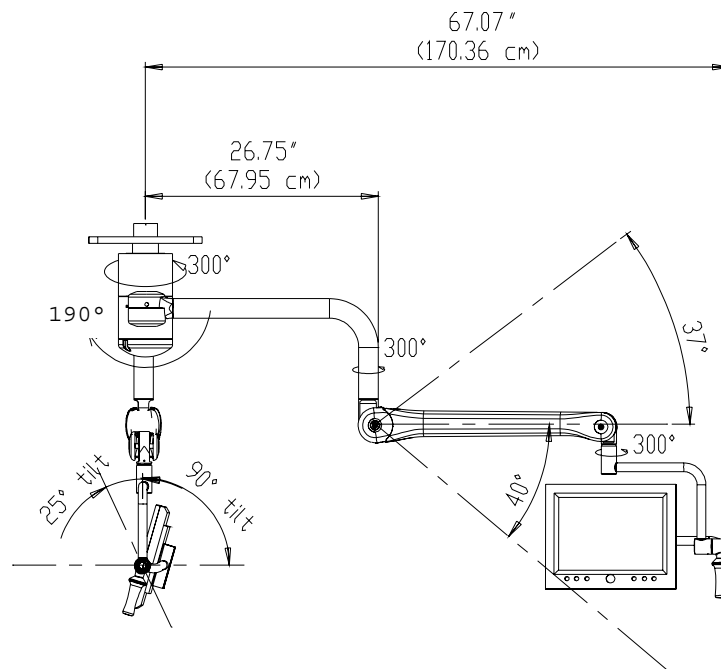
The suspension arms rotate 300° around the ceiling mount, and are positioned 180° apart to avoid interfering with each other. The counterbalance arm rotates 300° around its vertical extension. These extension pieces are custom-sized according to the ceiling height, assuring adequate clearance.

The monitor arm turns 300° around the end of the counterbalance arm. The monitor pivots 300° inside the arm. It can be moved completely out of the way when not in use, without affecting the light.

The combination of these individual elements allows medical personnel to freely move the monitor into a variety of positions using only slight pressure on the sterilizable positioning handle. Once positioned the system remains stable, for optimal viewing of almost any procedure.

If performed by a sterile staff member, grasp the sterilized handle, and position the monitor assembly in the desired position.

If performed by a non-sterile staff member, grasp the lower edge or side of the monitor (avoid touching the monitor screen) and position the monitor assembly in the desired position.



Instructions for Use of the Nuvo Video Display System

The Nuvo Video Display System is designed to view images from multiple sources, such as endoscopic cameras, remote video cameras, radiology, pathology, PACS, etc.

Systems may handle up to four separate input signals via an optional video switching board, although basic systems only handle one input.

Each source can be easily selected and viewed by pressing a button on the wall controls or on the sterilizable handle at the monitor.

To Turn the Monitor On/Off:

Turn the monitor system on by using the on/off switch located on the back of the monitor.



CAUTION:

Ensure the monitor is turned off when not in use. Failure to do so will decrease the life of the monitor.



CAUTION

Some video sources are unstable during their power on sequence – it may be necessary to turn the monitor power off, then back on for the image to be displayed properly.



CAUTION

The optional video display system requires the monitors are powered on before input selections are made.



Monitor
On/Off
Switch

To Connect a Video Source to the Video Display System



CAUTION:

Take care to align the pins on the connector with the holes in the plug on the input panel. Do not force the connector into the plug as this may damage the connector.

Plug the video cable (supplied by others) into a Video Input Panel having the same video format.



Composite Video



S-Video



RGB Video

NOTE:

The composite video cable must be twisted clockwise to ensure that the cable is securely locked.

The s-video connector can only be inserted in one orientation and does not have any mechanical retention, other than the friction fit of the pins.

The RGB video cable must be secured with the two small jack screws on either side of the connector.

To Connect the Video Display System to a Display



CAUTION:

Take care to align the pins on the connector with the holes in the plug on the output panel. Do not force the connector into the plug as this may damage the connector.

Plug the video cable (supplied by others) into the nearest appropriate Video Output Panel.

NOTE:

Output panels are provided with sockets for each video format available for input signals, with the exception that Composite video signals are converted to S-Video signals for display and output.

Always ensure that the output signal is compatible with

- (a) the signal to be recorded or displayed and
- (b) the device to which it will be connected.

NOTE:

Output Panels are labeled Output A and Output B. The signal delivered to Output A duplicates the signal displayed on Monitor A and, if a second monitor (Monitor B) is provided, then its display image is duplicated at the Output B panel.



NOTE:

The s-video connector can only be inserted in one orientation and does not have any mechanical retention, other than the friction fit of the pins.

The RGB video cable must be secured with the two small jack screws on either side of the connector.

The RS-232 cable must be secured with the two small jack screws on either side of the connector. This RS-232 port is only configured for use with National Display Systems monitors.

To Select a Video Signal for Display at a Monitor Using the Optional Wall Control

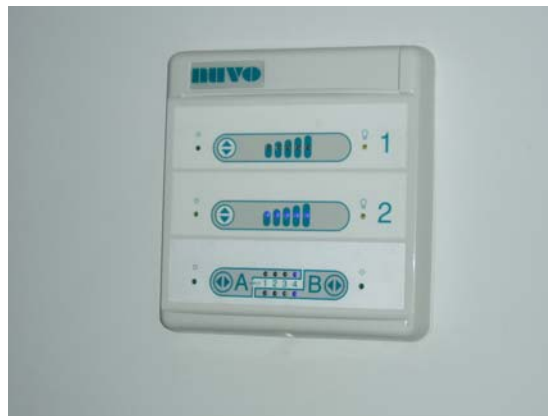
NOTE:

This section applies only to systems with the optional video switching.

NOTE:

The Wall Control Panel is an optional feature and may not be included in the system. Identical functionality is available from the button, if provided, on the monitor's sterilizable handle.

1. Determine whether Monitor A or Monitor B is to be switched.
2. Go to the Wall Control, where the bottom panel is dedicated to video switching. Press the associated button (to the left of the panel for Monitor A, to the right for Monitor B) repeatedly until the desired image appears on the monitor.



NOTE:

For systems which have a single video source, there is no need for switching and the wall control panel is not provided.

NOTE:

The video channel selected for display is indicated by one of the four blue LED indicators associated with that monitor on the panel. If fewer than 4 video inputs are provided, or if any monitor does not have a video source connected to it, the monitor will show a blank image when the associated channel is selected.

To Select a Video Signal for Display at a Monitor Using the Monitor Handle

NOTE:

This section applies only to systems with the optional video switching.

Video Display Systems with switching capability may be provided with a button at the bottom of the sterilizable handle adjacent to each monitor. Channel selection is achieved by repeatedly pressing this button until the desired image is displayed.



NOTE:

The selection button on the handle performs the same function as the selection button at the optional wall control panel.

NOTE:

This operation should only be performed by a surgeon or other sterile staff member. Operation by a non-sterile member of staff will contaminate the handle, which should be immediately replaced with a sterile handle or covered by a sterile disposable cover.

NOTE:

The video channel selected for display is indicated at the wall control panel by one of the four blue LED indicators associated with that monitor. If fewer than 4 video inputs are provided, or if any monitor does not have a video source connected to it, the monitor will show a blank image when the associated channel is selected.

To Remove the Sterilizable Handle and Reinstall



To Remove:

Grasp the handle, and rotate it counterclockwise until the handle is loose.

To Install:

- Install the handle onto the monitor cradle.
- Rotate the handle clockwise until fully seated against the O-Ring
- Activate the selection button, if provided, to verify operation.

NOTE:

The Sterilizable Handle must be sterile during surgical procedures. Therefore, suitable precautions should be taken during installation to ensure that sterility is not compromised. Either use a sterilized handle or cover a non-sterile handle with a suitable sterile handle cover (i.e., a light glove or “condom”).

To Adjust the Monitor Image:

For proper procedures to adjust the monitor image, refer to the Monitor Manual.

NOTE:

In some configurations, the monitors are supplied by others, in which case the associated manuals are not provided by Nuvo Surgical.

Maintenance



WARNING:

Only facility-authorized maintenance personnel should perform maintenance on the Nuvo Surgical Monitor. Maintenance performed by unauthorized personnel could result in personal injury or equipment damage.

Cleaning/Sterilization

Cleaning:



CAUTION:

Care should be taken not to pour cleaning fluids onto the rotating joints or monitor. It is recommended to use a moist cloth to wipe down the joints and monitor. Ensure that no moisture seeps into the rotating joints or monitor.

Using enzymatic detergents aids in the decontamination process. Measure all detergents carefully, and use them in accordance with the manufacturer's instructions.

Take care to avoid the use of cleaning materials that contain high concentrations of alcohol or chlorine as these may lead to premature aging of the monitor screen.

NOTE:

All surfaces which are within reach of staff should be cleaned between each surgical procedure.

Sterilization:

Sterilization, if desired, can be accomplished by using any FDA-cleared liquid sterilant. In areas outside of the USA, follow individual facility policies addressing the use of liquid sterilants. Manufacturer's recommendations should always be followed.

Sterilizable Handle

After every surgical operation:

- Remove the handle from the lighthead
- Wipe with a disposable cloth
- Clean and disinfect in a suitable cleaning and disinfecting machine
- Sterilize the handle

The sterilizable handle can be sterilized three ways:

- Cold, by using cleaners recommended for hospitals and authorized by a competent health authority
- Steam
- Flash in either gravity displacement or pre-vacuum sterilizers

The minimum flash exposure times are shown in the following table:

Handle Cleaning and Sterilization		
Sterilize cycle	Temperature	Exposure Time
Gravity displacement	270-274° F @ 30 psi (132-134° C @ 207 kPa)	3 minutes
Pre-vacuum	270-274° F @30 psi (132-134° C @ 207 kPa)	3 minutes

NOTE:

The sterilized handle should only be fitted immediately before use.

NOTE:

Service Life of Sterilizable Handle: Frequent sterilization causes natural degradation of the replaceable handle. If signs of material fatigue such as cracking or discoloration occur, the handle should be replaced.

NOTE:

If preferred, sterile handle covers can be used, as described below, instead of replacing the sterilizable handle after each procedure.

Using Optional Sterile Handle Covers

The sterile handle accepts the use of the LiteGlove^{®1} flexible light handle cover by Devon, or equivalent products, from Medical Action or DeRoyal

To install the handle cover, follow these steps:

1. Take the cover from its packaging.
2. Unfold the cover as needed.
3. Install the cover over the sterile handle.

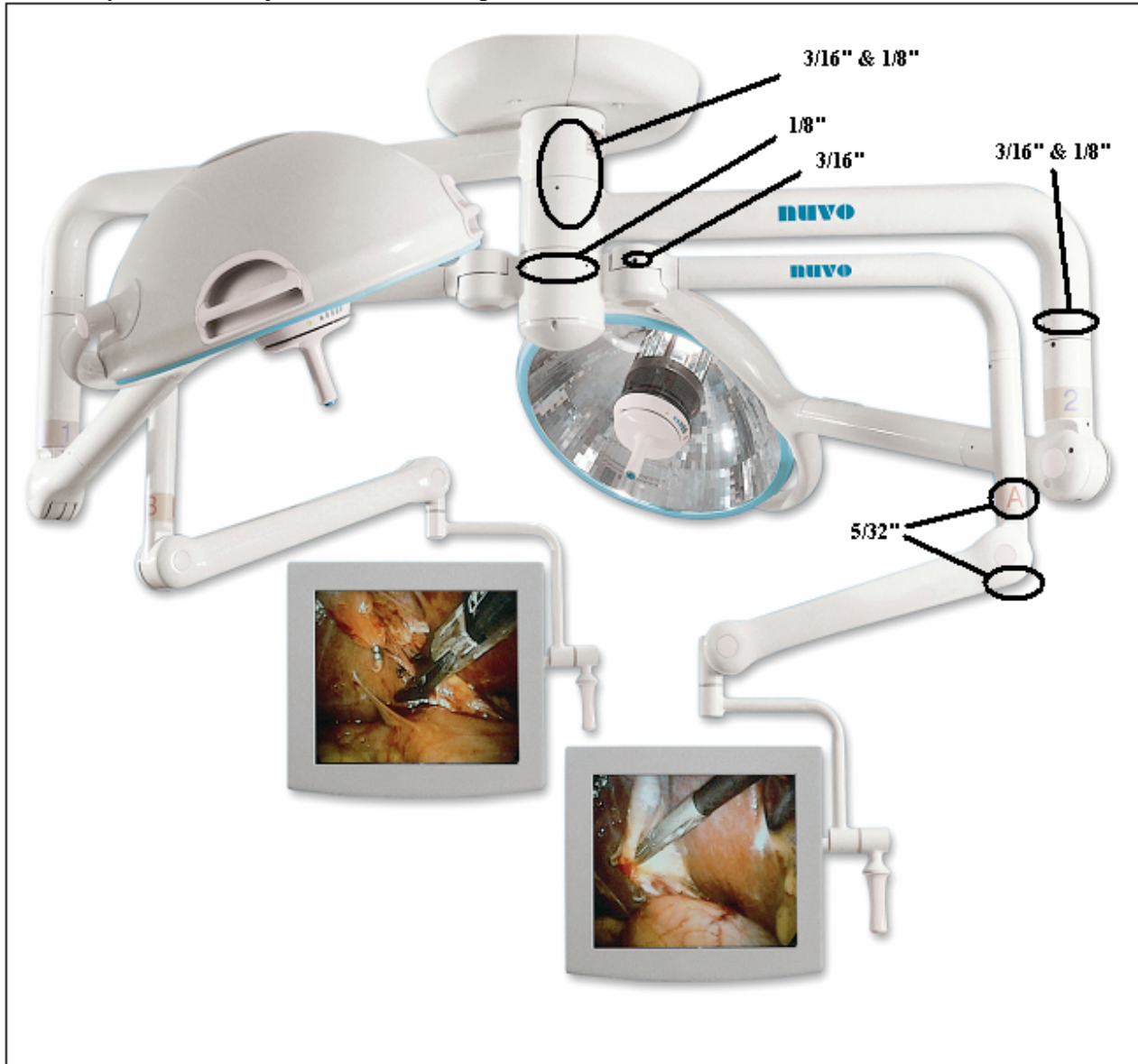
¹ LiteGlove[®] is a registered trademark of Devin Industries, Inc.

Preventive Maintenance

Annual preventive maintenance must be performed by Nuvo authorized personnel to ensure all feature are functioning as originally designed.

Pay particular attention to:

- The condition of the video input and output connectors
- System drift adjustment. See the picture below for Allen® wrench sizes.



Consumable Parts

- Sterilizable handle with Control Button Part number S2A00074
- Sterilizable handle without Control Button Part number S2Z00137

Troubleshooting

Image Not Displayed

Monitor not powered on
Video source not powered on
Damaged video cable
Input selection doesn't match image
Incorrect monitor selection
Incorrect input selection
Monitor not in sync with source

Turn monitor power switch to ON
Turn video source power switch to ON
Replace with good cable
Re-select the input using the wall control
Select correct inputs for "A" and "B" monitors
Select correct inputs for "A" and "B" monitors
Turn monitor OFF and back ON

Poor Image Quality

Damaged video cable
Monitor color settings incorrect

Replace with good cable
Adjust color setting to optimize the video
(see the user manual for the LCD display)

System Drift

Brake(s) set improperly

Adjust brakes (see the maintenance section)

Nuvo Video Display System Specifications

Dimensions for Product V1360 Nuvo Video Display Systems

Feature	Dimension
Counterbalance arm outer clevis to finish floor	78" (198 cm)
Suspension arm inner hub center line to outer hub center line	26.75" (68 cm)
Suspension arm inner hub center line to outer most point on monitor frame	67" (170 cm)
Monitor size	19" (48 cm)
Minimum ceiling height	Maintaining a 78" (198 cm) minimum counterbalance arm outer clevis to finished floor
No light	8' 0" (244 cm)
Single light	8' 7" (262 cm)
Dual light	9' 0" (274 cm)

Monitor Specifications

Feature	Dimension	
	19" Vector3 Monitor	19" Radiance/EndoVue Monitor
Screen size	19" (48 cm)	19" (48 cm)
Brightness	250 cd/m ²	340 cd/m ²
Resolution	1024 x 768 Extended Graphics Array (XGA)	1280 x 1024 (SXGA)
Dot Pitch	0.294 mm	0.294 mm
Viewing angle	170° horizontal 170° vertical	170° horizontal 170° vertical
Contrast ratio	600:1	650:1
Input sources	Composite Y/C (S-Video) RGBS RGBHV	Composite Y/C (S-Video) RGBS RGBHV
Storage height (head clearance)	78" (198 cm)	78" (198 cm)
Low position (floor clearance)	49" (124 cm)	48" (124 cm)

NOTE:

The above monitor specifications are applicable to the National Display Systems medical grade monitors offered by Nuvo Surgical. Alternative models may be provided by others or, for special configurations, by Nuvo Surgical.

Environmental Conditions for Transport and Storage

Description	Specification
Temperature	-4°F(-20°C) to 140°F (60°C)
Relative humidity	20% to 90% non-condensing
Pressure	50 kPa to 106 kPa

Environmental Conditions for Use

Description	Specification
Temperature	59°F (15°C) to 95°F (35°C) ambient temperature
Relative humidity range	5% to 80% non-condensing

Mains Power Requirements

Rated Voltage	Maximum Current	Rated Frequency
100-240 V~	2.0A~	50/60 Hz

Ceiling Structure Vertical Load Characteristics

Description	Specification
Monitor suspension with two monitors	175 lb (79 kg)
Monitor and single light suspension with two monitors	275 lb (125 kg)
Monitor and dual light suspension with two monitors	380 lb (172 kg)

Ceiling Structure Moment Load Characteristics

(Based on two monitor arms)

Description	Specification
Monitor suspension with two monitors	310 ft-lb (420 N m)
Monitor and single light suspension with two monitors	720 ft-lb (976 N m)
Monitor and dual light suspension with two monitors	1105 ft-lb (1,498 N m)

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