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Life Scope® SVM-7200 Series Vital Signs Monitor
Clinical Reference Guide

Version 1
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Introduction

This Clinical Reference Guide is designed to assist you to learn the monitor's basic operations during the pre-implementation training class or as a self-study tool as you use the system on your clinical unit. It is also designed as a reference tool when you need a refresher for infrequently performed procedures.

The procedures in this guide regard the Life Scope® SVM-7200 series Vital Signs Monitor. The Vital Signs Monitor can be used in an adult or pediatric environment.

The Clinical Reference Guide is an adjunct to the Operator's Manual and does not replace it. Please refer to that manual for critical technical and other specific information, and for additional information as directed in this guide.

■☞ Whenever you see this icon in this guide, a one touch "shortcut" is available for the particular function. That shortcut is described next to the icon.

For additional assistance, please contact your hospital biomedical services representative. For technical or clinical product assistance, a toll-free customer support service is provided at 1-800-325-0283.

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Life Scope® SVM-7200 Series Vital Signs Monitor

Front View
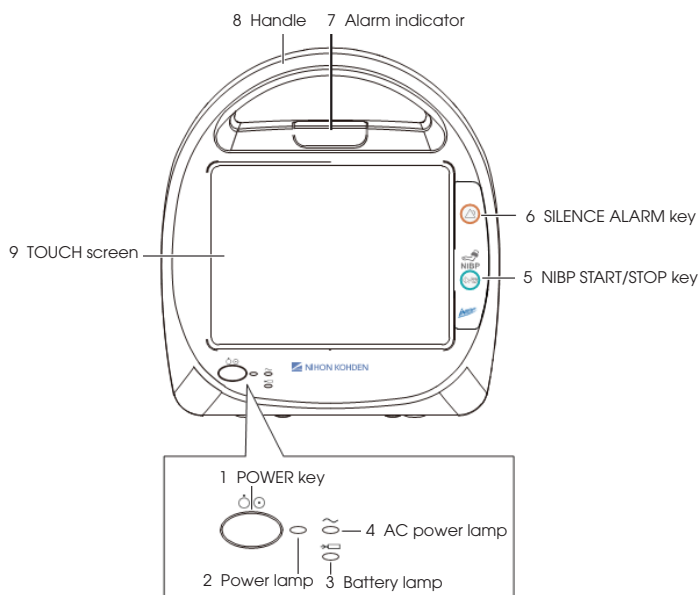
	Item	Description
1	**POWER key**	Press and hold for more than 1 second to turn the monitor power on or off.
2	**Power lamp**	Lights when the monitor power is turned on.
3	**Battery lamp**	Indicates the status of the battery pack. Refer to Section 2 for details of the battery pack.
4	**AC power lamp**	Lights when the power cord is connected between the AC SOURCE socket and AC outlet.
5	**NIBP START/STOP key**	To start or stop NIBP measurement.
6	**SILENCE ALARM key**	To silence the alarm sound and indications.
7	**Alarm indicator**	Red or yellow lamp blinks, or yellow or cyan lamp lights according to the alarm settings. Green lamp blinks in synchronization with the patient's pulse.
8	**Handle**	For carrying the monitor.
9	**Touch screen**	Displays monitoring data. Touch a key or button on the screen to change the displayed screen and setting.

Left View

1 SpO₂ Socket

2 Defibrillation-proof part symbol

3 NIBP socket

5 Caution label
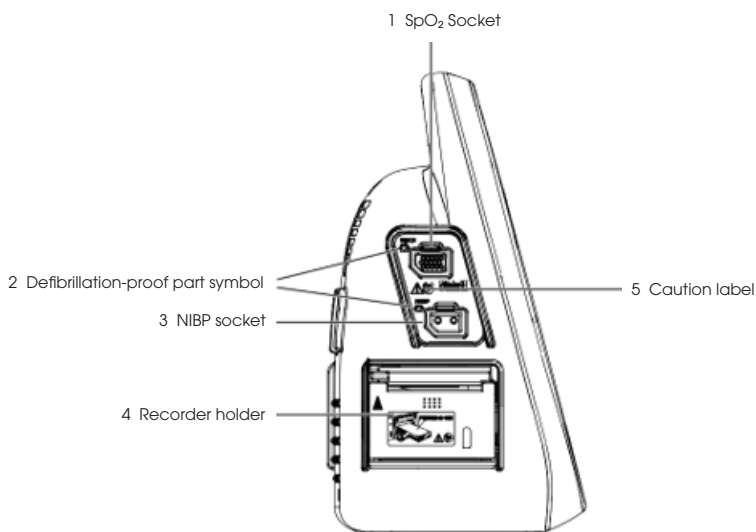
4 Recorder holder

	Item	Description
1	**SpO₂ socket**	Connects to specified SpO₂ connection cord.
2	**Defibrilliation-proof part symbol**	Part symbol.
3	**NIBP socket**	Connects to the air hose.
4	**Recorder holder**	For mounting a recorder.
5	**Caution label**	Refer to Operator Manual for details.

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Right View

1 Battery pack holder
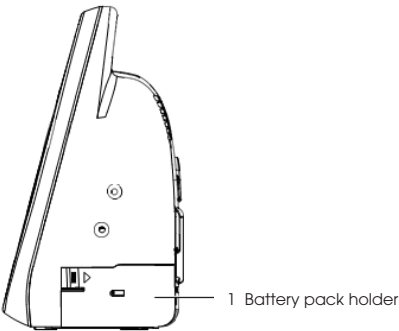
	Item	Description
1	**Battery pack holder**	For mounting a battery pack.

Top View (With Wireless LAN Module)

1 WLAN power lamp

2 WLAN LINK lamp
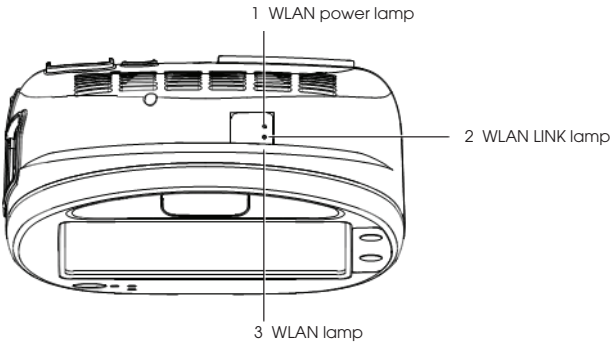
3 WLAN lamp

	Item	Description
1	**WLAN Power lamp**	Lights when the WLAN power is turned on.
2	**WLAN LINK lamp**	Lights when the WLAN power is ready.
3	**WLAN lamp**	Lights when WLAN is connected.

Rear View

7 Potential equalization terminal

1 WLAN setup button

6 AC power source socket

2 Temperature socket

3 Serial socket

4 Network socket

5 USB sockets
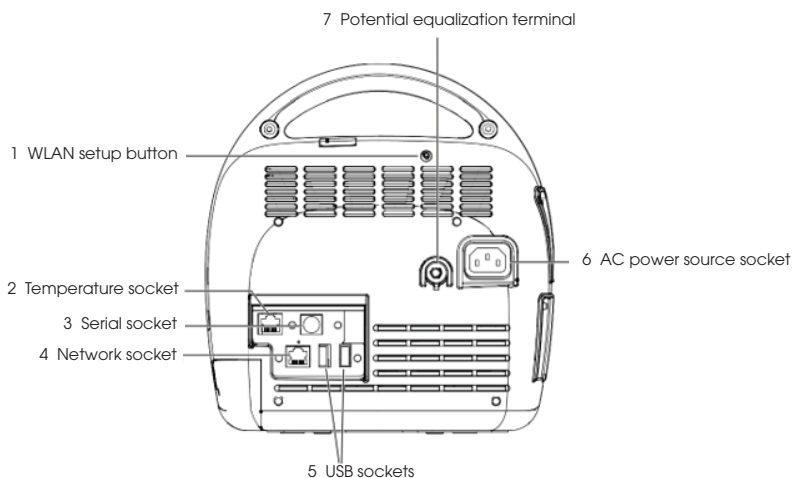
	Item	Description
1	**WLAN setup button**	Press and hold for more than 5 seconds to restore to the default setting. Press and hold for 1 second and less to reset WLAN.
2	**Temperature socket**	For mounting a temperature probe.
3	**Serial socket**	For serial communication.
4	**Network socket**	Connects to monitor network system by a network cable.
5	**USB sockets**	For USB memory or barcode reader or keyboard.
6	**AC power source socket**	For the AC power cord.
7	**Potential equalization terminal**	For a potential equalization terminal conductor.

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Admitting a New Patient and Inputting Patient Information

Open the NEW PATIENT window to add a new patient. There are three methods to open the NEW PATIENT window:

- Use a barcode reader and scan the barcode of the patient;

- Press the NEW PATIENT key on the main screen when it is customized to the screen;

- Press the MENU key on the main screen to open the MENU window. Press the PATIENT LIST key from the MENU window and then press the NEW PATIENT key to admit a new patient.

Inputting the PATIENT ID

1. Touch the PATIENT ID key on the NEW PATIENT window and then enter the patient ID by using the touch keys.

   Or, on the Home screen, scan the patient ID by using the bar code scanner, the Patient ID will be entered automatically.

   Up to 16 characters can be entered.
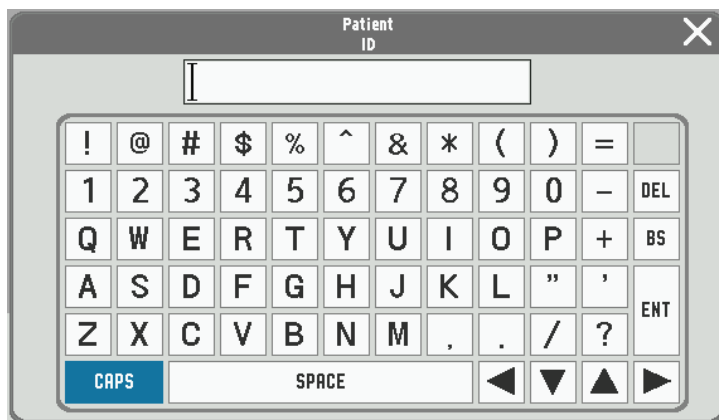
2. Touch the ENT key to confirm the input and then return to the NEW PATIENT window.

Inputting the PATIENT NAME

1. Touch the PATIENT NAME key on the NEW PATIENT window and then enter the patient name in the pop-up window.

   OR, on the Home screen, scan the patient name by using the bar code scanner; the patient name will be input automatically (if connected to network ADT server).

   Up to 15 characters can be entered.
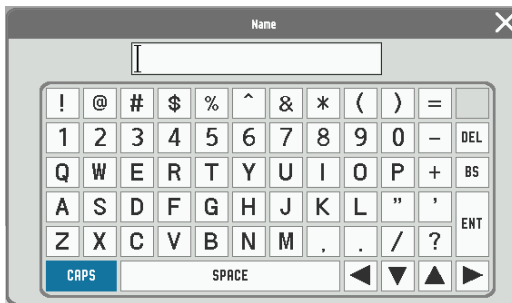
2. Touch the ENT key to confirm the input and then return to the NEW PATIENT window.

Inputting the Date of Birth
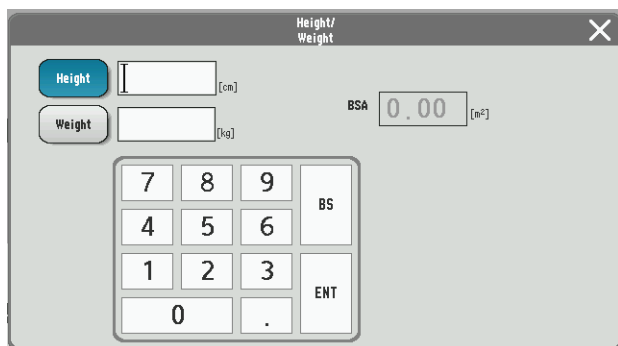
1. Touch the DATE OF BIRTH key on the NEW PATIENT window and then input the date of birth.

2. Touch the SET key to save your input and return to the NEW PATIENT window or PATIENT INFO window by touching the key.

   NOTE: If you close the BIRTH DATE/AGE window without touching the ENT key, the date of birth will not be changed.

Inputting the Height and Weight

1. Touch the HEIGHT or WEIGHT key on the NEW PATIENT window and then input the height and weight separately.

2. Touch the ENT key to save your input and return to the PATIENT INFO window by touching the ✕ key.

   NOTE: If you close the HEIGHT/WEIGHT window without touching the ENT key, the entered height and weight cannot be saved.

Managing Patient Information

1. Use the keys on the PATIENT WINDOW to add, delete, and change the patient information.

2. Touch the PATIENT LIST key on the MENU window to display the PATIENT LISTwindow.

3. To delete a patient's information, select the patient information and touch the DELETE key.

    NOTE: A currently admitted patient cannot be deleted.

4. To change a patient's information, select the patient information and touch the SELECT key to open the NEW PATIENT window.
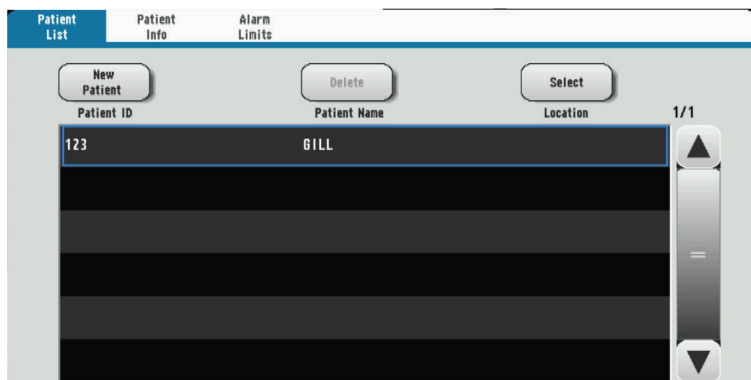
Discharging a Patient

In Spot Mode

1. Touch the SAVE key on the Home screen. Open the SAVE window. All the parameters are selected as default.

2. Touch the items to unselect parameters. The unselected item turns gray.

3. Touch the SAVE* or SAVE & SEND* key to send the selected parameter to EMR and save to file. After the data is sent successfully, the patient will be discharged automatically, and the monitor is available for the next patient.

    In **spot mode**, a patient will be discharged automatically after his or her data is saved. To readmit the patient, touch the PATIENT LIST key to select the patient.

In Continuous Mode

1. Touch the MENU key ➜ PATIENT INFO key.

2. Touch the QUIT PATIENT key on the bottom right of the window. The QUIT PATIENT window appears.

3. Touch the YES key to quit monitoring. The data is cleared from the Home screen.

    Or, touch the QUIT PATIENT key on the Home screen when it is customized to the Home screen.

Saving and Sending Patient Information

In Spot Mode

1. Touch the SAVE key after admitting a patient. Open SAVE window.

2. All the parameters are selected as default. Touch to unselect parameters.

3. Touch the SAVE key to save the selected data locally.

   Or, touch the SAVE & SEND key to save the selected data in local and send to the external system.

   When the SAVE & SEND key is touched, if the data is sent to the external system, a corresponding visual and auditory message will appear, and the record of the data will be saved in the SPOT TABLE in dim gray.

   Alternatively, a corresponding visual and auditory message indicating failure will appear, and a confirmation window will be displayed. Touch the SAVE & SEND key in the confirmation window to resend. If the data fails to be sent again, a timeout message will appear, and the record of the data will be saved in the SPOT TABLE in black.

NOTE: When the memory becomes full, the oldest file is deleted to create a new file.

In Continuous Mode

Touch the SAVE key to save the data. The data will be saved in the ID of the patient currently logged in. If there is no patient logged in, the data will be saved in an unused ID assigned by the system.

Display

NOTE: The background color indicates the current mode.

Spot mode: Black background   **Continuous mode:** Blue background
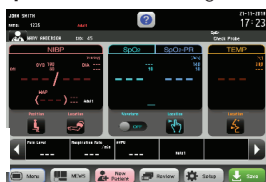
Basic Operation

The monitor can be operated by touch keys on the screen. Touch one of the operation keys or function keys on the screen to perform an operation, change a setting, or open/close a window. When a key is touched, there is a beep sound.

There are two monitoring modes within the monitor: **spot mode** and **continuous mode**. Change the mode by touching the MODE CHANGE key on the MENU window.

Clinician and Patient Information   Indication area   Clock

Measuring data

Measuring data display area

MENU Key. Touch this to open the menu screen.

Customized keys

SAVE Key. Touch this key to save the measurement data.

Menu

SETUP window   PARAMETERS window

Access to review screens

PATIENT window

Alarm limits

ALARM window

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Modified Early Warning Score

The modified early warning score (MEWS) is a tool to quickly determine the degree of illness of a patient. It is based on vital signs such as SpO_2, NIBP, temperature, respiratory rate, etc. and can be customized to your facility's standards or protocols by your system administrator.

To Get a Modified Early Warning Score (MEWS)

1. Display the MENU window.

2. Touch the MEWS key on the MENU window to display the MEWS window.

   Or, touch the MEWS key on the Home screen when it is customized to the Home screen.

3. Touch the MEWS key to close the MEWS window and return to the Home screen.

Monitoring Parameters

NIBP Monitoring

Cuff selection should be based on the size of the patient's arm. The American Heart Association recommends that the cuff width be 40% of the circumference of the upper arm. Inappropriate cuff sizes can result in inaccurate NIBP results.

Starting and Stopping NIBP Measurement

1. Make any necessary changes to the NIBP settings by touching the NIBP parameter, or touch MENU ➜ NIBP.

2. Touch the NIBP START/STOP key on the right of the monitor to start measuring.

3. To stop the measurement, touch the NIBP START/STOP key again. The cuff will deflate.

Changing NIBP Settings

Change the settings on the NIBP window.
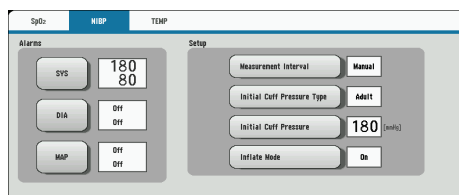
The following settings can be changed by touching the appropriate data field for monitoring NIBP.

- NIBP alarm limits
- MEASUREMENT INTERVAL (only available in continuous mode)
- INITIAL CUFF PRESSURE TYPE
- INITIAL CUFF PRESSURE
- INFLATE MODE (CAN ONLY BE USED WITH NIHON KOHDEN SPECIFIED CUFFS)

NIBP Interval Settings

Manual Measurement – No interval will be set. NIBP measurement is obtained by touching the NIBP START/STOP key on the right side of the monitor.

STAT Measurement – Must be in **continuous mode** to operate. Measurements are performed continuously according to the measurement program set by your administrator. The program is divided into two stages of interval settings and is limited to 1-minute intervals during the first stage.

SIM Mode – Must be in **continuous mode** to operate. Measurements are performed continuously according to the measurement program set by your administrator. The program is divided into two stages of interval settings and is limited to 2.5-minute intervals during the first stage.

Interval mode (Must be in continuous mode) – An automatic interval can be selected to measure NIBP. To change intervals, touch MEASUREMENT INTERVAL key and select desired NIBP intervals.

Venous Puncture Mode

NOTE: **Venous puncture mode** must be set to ON by your administrator to use this function and **CANNOT** be used if an NIBP interval is set.

For aid in inserting a venous line, you can use **venous puncture mode** to inflate the cuff to a target pressure in order to prevent venous backflow. Venous backflow causes swelling of the veins and makes it difficult to insert a venous line.

In **venous puncture mode**, the cuff automatically deflates 2 minutes after inflation in **Adult/Child mode** or 70 seconds after inflation in **Neonate mode**.
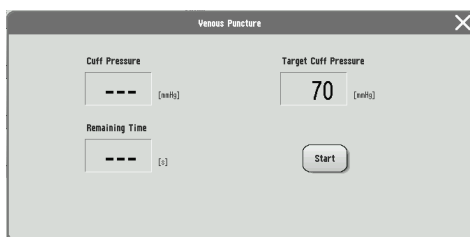
Cuff Size

Ensure that the correct cuff size is used for each patient. Larger cuffs will result in lower readings and smaller cuffs will result in higher readings.

Each cuff covers a range of limb sizes.

Select a cuff size that is balanced for the limb. When applying the cuff, look at the range marks. Use a cuff size that is centered on the range mark. For example, if the limb is 10.5 cm, using a 6 to 11 cm cuff will not provide the best readings. Instead, use an 8 to 14 cm cuff.
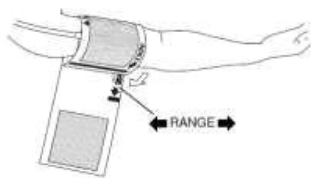
- If readings are higher than expected, try a larger cuff, and if readings are lower than expected, try a smaller cuff.

- Manual NIBP can be used to check the accuracy of the NIBP measurement.

Cuff Positioning

NIBP cuffs use an air bladder to occlude the artery during measurement. To obtain accurate readings, the cuff must be correctly positioned over the artery.

- Each cuff should have a mark indicating the position of the artery in relation to the cuff. The mark is usually close to the air hose. Ensure that the mark is positioned directly over the artery.

Patient Type

Patient type is automatically recognized when the cuff is connected to the monitor. The patient type setting on Nihon Kohden monitors is controlled by the type of NIBP hose used. Both Adult/Child and Neonatal hoses are available.

Measuring Mode

There are two measuring modes for the monitor: **deflation mode** and **inflation mode**. The factory setting is **deflation mode**, and **inflation mode** is set to OFF.

NOTE: **Inflation mode** will only work with Nihon Kohden approved cuffs.

Deflation Mode

When the pressure deflates slowly, the change of artery pulse wave is regarded as the change of cuff pressure, and blood pressure is calculated by the amplitude pattern.
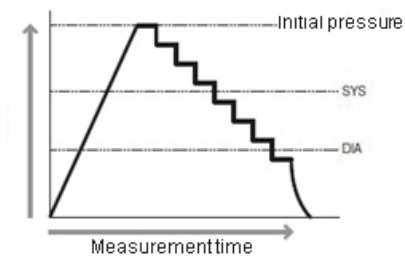
Inflation Mode

When inflating the cuff gradually, the change of artery pulse wave is regarded as the change of cuff pressure, and blood pressure is calculated by the amplitude pattern. In this mode, cuff inflation is lower than in deflation mode and can be measured in a short time.
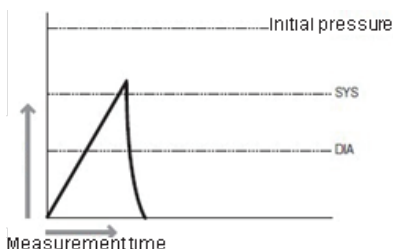
SpO$_2$ Monitoring

The Nihon Kohden Vital Signs Monitor uses an SpO$_2$ cable, which accepts reusable or disposable probes. The monitor comes with three options for pulse oximetry: Nihon Kohden, Nellcor, and Masimo technology. Refer to the Operator's Manual for specific technology differences.

Connect the appropriate SpO$_2$ probe to the monitor cable, attach the probe to the patient, and begin monitoring.

Starting SpO$_2$ Measurement

When the preparation is done properly, the SpO$_2$ value and pulse waveform appear on the screen.

NOTE: Settings may be different depending on the SpO$_2$ technology utilized on your Nihon Kohden monitor.

Changing SpO₂ Settings

Change the settings on the SpO₂ window.
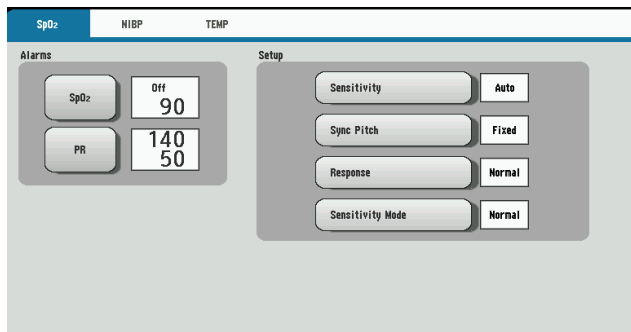
The following settings can be changed for SpO₂ monitoring:

- SpO₂ and pulse rate alarm limits
- Pulse waveform sensitivity
- Sync pitch
- Response mode
- Sensitivity mode
- Average Time (Masimo Only)
- Fast Sat (Masimo Only)

The SpO₂ pulse waveform sweep speed is the speed set for <Sweep Speed> on the DISPLAY/SOUND window.

Temperature Monitoring

Taking a Temperature

The SVM-7200 Vital Signs Monitor comes with an Exergen Temporal Scanner or a Covidien Sensor in a blue or red casing for temperature monitoring. Please review the Operator's Manual for further instructions.

1. Ensure the appropriate probe casing is attached if using the Covidien Sensor (blue for oral/axillary and red for rectal).

2. When the temperature scanner/sensor is withdrawn, the thermometer turns on automatically.

3. Proceed to take the patient's temperature as explained below.

Exergen Temporal Scanner

1. Slide across forehead.

    Place probe flush on center of forehead and depress button. Keeping button depressed, slowly slide probe mid-line across forehead to hair line.
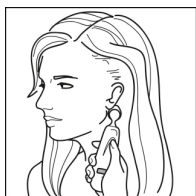
2. Slide behind ear. (Skip this step if the patient is an infant.)

    Press and hold button, lift probe from forehead, touch behind ear halfway down mastoid process and slide down to soft depression behind earlobe.
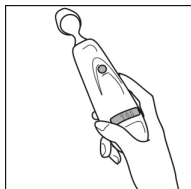
3. Release button and review results.

Covidien Sensor

Use only Filac 3000 AD/ADA Electronic Thermometer probe covers with this device. Use of any other probe cover will result in erroneous temperature readings.

Applying Probe Covers

1. Peel off probe cover box cover in the direction of the arrow on the box.

2. Insert a box of probe covers into the top of the temperature sensor casing.

    NOTE: A blue casing is indicative of oral and axillary use, and a red casing is indicative of rectal use. Insert the appropriate colored casing before each use. Please see the Operator's Manual for casing removal.

3. Withdraw the probe from the probe well. The thermometer is automatically open.
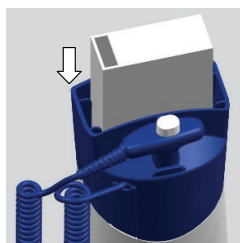
    NOTE: The icon ⚕ is flashing on the display screen, reminding the user to apply or remove a probe cover.

4. Insert the probe end into a cover in the box. Push the handle firmly until you feel the cover "snap" into place.

5. Take appropriate temperature measurement (oral, axillary, or rectal).

    NOTE:

    • After measurement, push the top button to eject the used cover into a bio-waste container.

    • Probe covers are consumables. Remove, discard, and replace boxes when empty.

Setting the Modes of Temperature Measurement

Open the TEMP window and touch MEAS MODE to change the temperature measurement mode to Quick, Standard, or Direct

Four temperature measurement modes are available: **Standard mode**, **Direct mode**, **Quick mode**, and **Cold mode**.

Standard Mode

1. The thermometer normally operates in Predictive mode for accurate temperature measurement. In certain cases, such as with a hypothermic patient, the thermometer will automatically shift to **Direct** (slow) **mode** and will then act as a temperature monitor.

Direct Mode (Oral & Axillary & Rectal)

1. The thermometer can be set to operate exclusively in **Direct mode (disable Predictive mode)**.

2. In **Direct mode** the device may require up to 60 seconds to reach equilibrium and display patient temperature.

Quick Mode (Oral Only)

1. **Quick mode** is provided for more rapid, time consistent, oral temperature predictions. This mode is indicated by a rabbit icon on the display. In this mode, a temperature measurement prediction is provided in approximately 3.5–4 seconds.

2. **Quick mode** is not available with Axillary or Rectal Body Sites, with **Cold mode**, or when in **Direct mode**.

Cold Mode

1. **Cold mode** is provided for use in applications where body temperatures may be lower than normal, such as in patients recently out of surgery.

2. **Cold mode** is not available with **Quick mode** or when in **Direct mode**.

Setting Temperature Alarm Limits

Touch the TEMP key on the MENU window to open the TEMPERATURE window and then set the upper and lower alarm limits.

Touch the desired tab to change the displayed parameters

Setting bar

Selected parameter
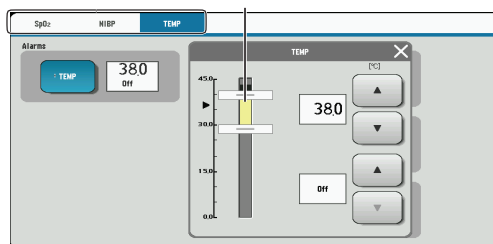
Upper limit slider

Lower limit

Current measured value

Lower limit slider

Alarm Types and Levels

There are two types of alarms – the vital signs alarm and technical alarm – and three alarm levels – crisis, warning, and advisory.

The monitor can indicate alarms both visually and audibly:

- Alarm sound

- Alarm message on the screen

- Alarm indicator: the alarm indicator indicates three alarm levels.

Alarm Level	Alarm Sound	Alarm Display on the Screen	Alarm Indicator LED	Alarm Recording
CRISIS	NK1 (Continuous pip sound), NK2 (Continuous ping sound) or IEC standard (ceg-gC)	Highlighted red message	Blinking red	Recorded at alarm occurrence when alarm recording on the Record window is set to ON.
WARNING	NK1 (Continuous bing bong sound), NK2 (Continuous ding ding sound) or IEC standard (ceg)	Highlighted yellow or orange message	Blinking yellow	
ADVISORY	NK1 and NK2 (Single beep every 20 seconds) or IEC standard (Single beep every 20 seconds)	Highlighted yellow or blue message	Lights in yellow or blue	

Alarm Message Display and Icons

When two or more alarms occur at the same time, the messages are displayed alternately in the alarm message display area.

Alarm message display area
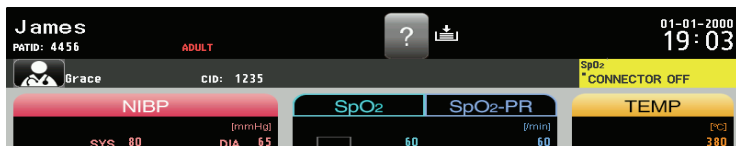
⚠	Alarm is silenced by touching the Silence Alarm key on the monitor. Remaining minutes appears.
⚠	Alarms are suspended (paused) for a certain period.
⚠	Alarms are suspended infinitely or vital sign alarm limit is set to OFF.
⚠	Alarms are reset.

Guide Menu

When a technical alarm occurs during monitoring, the guide symbol appears at the top of the screen. Touch the guide symbol to open the guide menu for that alarm.

Guide symbol

Silencing and Suspending Alarms

Silencing Alarms

When an alarm occurs, you can silence the alarm sound and indications by touching the SILENCE ALARM key on the monitor. When a vital signs alarm other than the NIBP alarm is silenced, the alarm resumes after the alarm silence ends. When several alarms occur together and the SILENCE ALARM key is touched, all alarms are silenced and technical alarms are reset.

When the vital signs monitor is connected to a central monitor network, all alarms other than the NIBP alarm are temporarily silenced by touching the SILENCE ALARM key on the central monitor. Refer to the central monitor Operator's Manual for details.

Suspending Alarms

All alarms can be suspended before they occur. During alarm suspension, all alarms are turned OFF for the specified period set by the administrator. This monitor has three types of alarm suspension:

- Suspend all alarms for 1, 2, or 3 minutes by touching the SUSPEND ALARMS key; for example, for probe replacement, etc. The time allowed will be set by the administrator.

- Alarm function resumes when the suspend alarm time elapses or the SUSPEND ALARMS key is touched.

- Suspend all alarms indefinitely by touching the ALL ALARMS OFF key on the MENU window. Your device may not have this function as it is set by the administrator.

- Alarm function resumes when the ALL ALARMS OFF key is touched.

- Suspend all alarms indefinitely by touching the SUSPEND MONITORING key. For example, suspend alarms while the patient is being examined.

- When the SUSPEND MONITORING key is touched, all alarms and NIBP measurements are suspended.

- Alarm function resumes when the SUSPEND MONITORING key or SUSPEND ALARMS key is touched or the desired conditions are met.

Alarm OFF Keys on the MENU Window
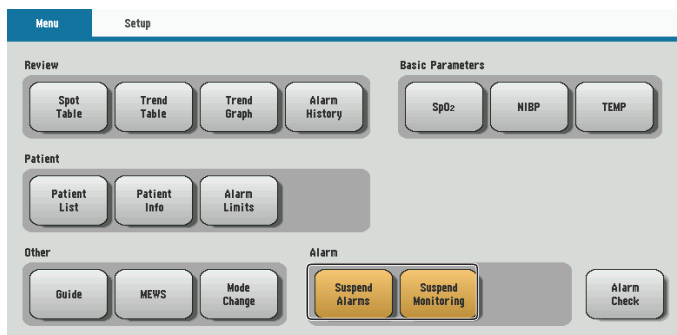
Alarm off keys

The SUSPEND ALARMS, ALL ALARMS OFF, and SUSPEND MONITORING keys are toggle keys. Touch once to activate and touch again to cancel.

Changing Parameter Alarm Limits

There are three ways to change vital signs upper/lower alarm limits. Review the Operator's Manual for further details.

- Change upper or lower alarm limits for each parameter individually from each parameter window by touching MENU and the desired parameter key, such as TEMP in the below illustration.

Touch desired tab to change the displayed parameters

Setting bar

Selected parameter
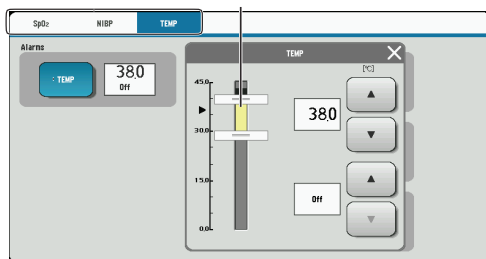
Upper limit slider

Upper limit

Lower limit

Current measured value

Lower limit slider

- Change upper or lower alarm limits for each parameter individually from the menu. Touch the MENU key, followed by the ALARM LIMITS key. Adjust alarm limits as desired.

- Set all alarm limits to the alarm master settings from the menu. Touch the MENU key, followed by the ALARM LIMITS key. Touch the ALARM MASTER key. The "APPLY SETTINGS FROM MASTER?" message appears. Select desired response.

Selected parameter

ALARM MASTER key

Apply settings from master?

Current measured value

Setting bar

Upper limit

Upper limit slider

Lower limit

Lower limit slider
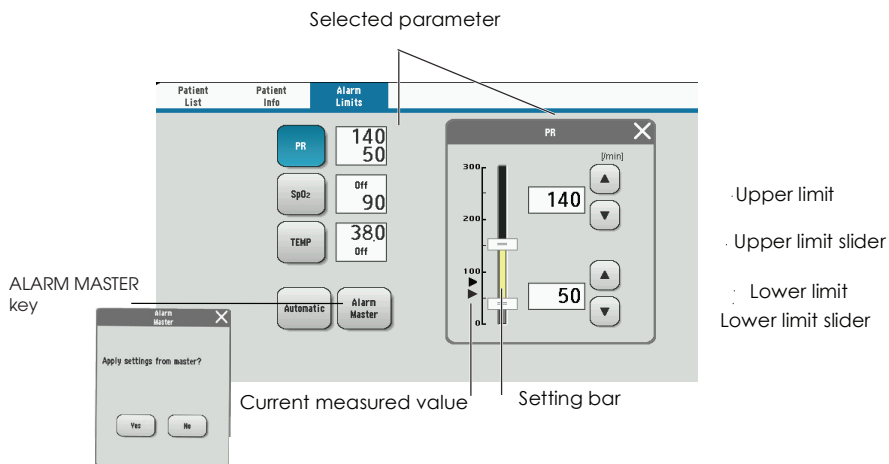
Review Windows

You can review saved data on the following review windows.

In **spot mode**, the SPOT TABLE window and ALARM HISTORY window are available.

In **continuous mode**, the SPOT TABLE window, TREND TABLE window, TREND GRAPH window, and ALARM HISTORY window are available.

Review Window	Display	Storage
SPOT TABLE window	Displays vital signs data	Up to 10,000 files of vital signs data can be saved
TREND TABLE window	Displays vital signs data	Up to 10,000 files of vital signs data can be saved
TREND GRAPH window	Displays vital signs trend graphs	Up to 10,000 files of vital signs graphs can be saved
ALARM HISTORY window	Displays a table of technical alarms	Up to 10,000 files of alarm history data can be saved

NOTE: The oldest file is deleted when the maximum number of files has been saved.

DISPLAY REVIEW Windows

Touch the MENU key on the screen to display the available REVIEW windows. The REVIEW windows that are not available will be grayed out.
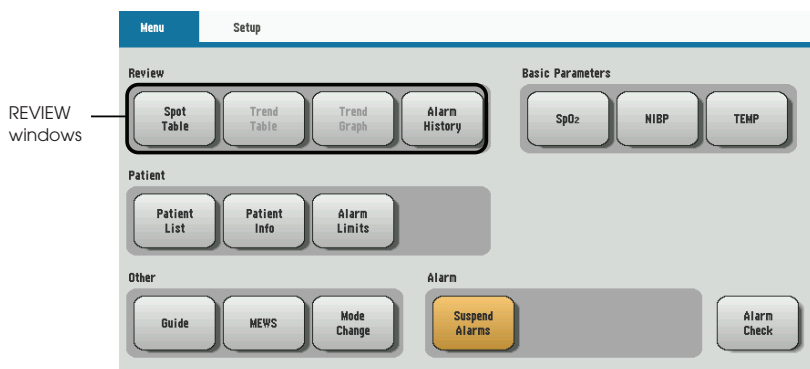
SPOT TABLE Window

When NIBP or TEMP measurement is completed or when SAVE is pressed, the measuring values may be displayed on the SPOT TABLE window.
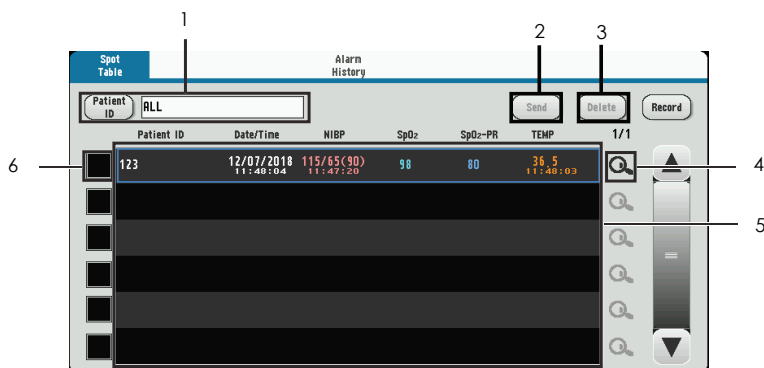
1. **Patient information filter area**
    Tap the dialog box to choose the patient name or ID. Tap ALL to display all data.

2. **Send key**
    Tap SEND to send the record you choose.

3. **Delete key**
    Tap DELETE to delete the record you choose.

4. **Details icon**
    Tap to display SPOT DATA DETAILS window.

5. **Record area**
    The records which have been sent are in gray. The records which have not been sent are in black.

6. **Check box**
    Tap a check box to choose the record you need.

TREND TABLE Window (in continuous mode only)
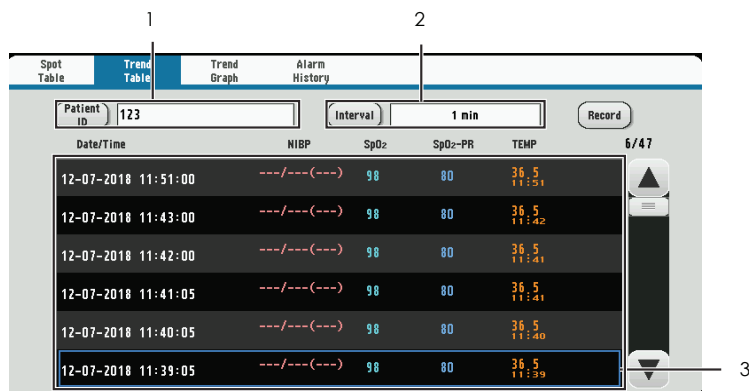
1. **Patient information filter area**
   Tap the dialog box to choose the patient name or ID. Tap ALL to display all data.

2. **Time interval filter area**
   Tap the dialog box to choose 1 min, 5 min, 10 min, 15 min, 30 min, or 1 h.

3. **Record area**
   The records which have been sent are in gray. The records which have not been sent are in black.

TREND GRAPH Window (in continuous mode only)

Cursor

Filter and
Event Bar

Scale

Time Bar

Setup
parameters

Set Up Scale

Graph
Selection

Record
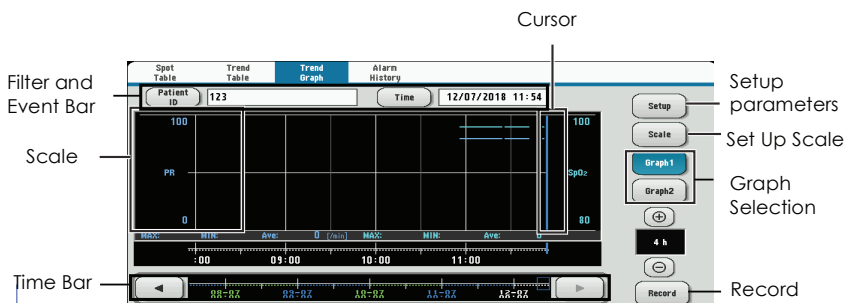
ALARM HISTORY Window

Display review windows

Date and
time of file
creation

Selected
file

Scroll to
display
additional
files

Parameter

Alarm history data

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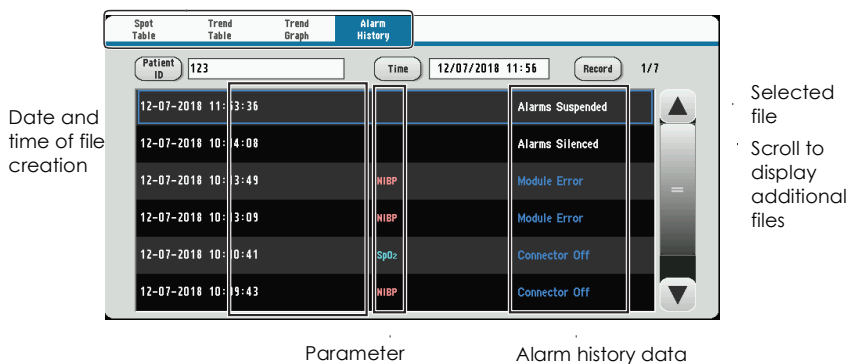
Cleaning and Disinfecting

Please consult the Operator's Manual or the Cleaning and Disinfecting Guide for a complete list of approved cleaning and disinfecting agents.

*The use of any other disinfectant solutions may cause damage to the equipment and may void the product warranty.

Screen Messages and Troubleshooting

Please refer to the Operator's Manual for further troubleshooting

	Screen Message	Parameter	Possible Cause/Criteria	Action
*	(– – –) Alarm	All parameters	Alarm occurred for the (– – –) (parameter).	Take appropriate action depending on the alarm level. (Displaying the Home screen may display the alarm in detail.)
*	Air Leak	NIBP	The cuff pressure does not change after inflation even after a certain period of time.	Connect the cuff to the air hose properly.
				Connect the air hose to the socket properly.
			The cuff or air hose is damaged.	Replace the cuff or air hose with a new one.
–	Alarm Silenced	All parameters	The SILENCE ALARMS key was touched to silence the alarm.	• When the alarm cause is resolved, the alarm is cleared. • When the SILENCE ALARMS key is touched during alarm silence, all alarms are resumed.
–	Alarms Suspended/ Suspend Monitoring	All parameters	The SUSPEND MONITORING key was touched.	• All alarms resume when the SUSPEND MONITORING key is touched again during alarm suspension. • Alarm suspension is canceled when monitoring starts.
–	All Alarms Off	All parameters	The ALL ALARMS OFF key is touched to suspend alarm function.	To resume alarm function, touch the ALL ALARMS OFF key.
*	Battery Weak	System	Battery pack is fully discharged.	Switch to AC power and charge the battery pack.

	Screen Message	Parameter	Possible Cause/Criteria	Action
*	Cannot Detect Pulse	NIBP	The patient's pulse wave is small.	Measure by palpation or the invasive blood pressure method.
			The cuff is not wrapped around the patient correctly.	Wrap the cuff around the arm of the patient properly.
		SpO_2	Poor blood circulation for measuring the SpO_2 value.	Check the patient's condition and probe attachment, or change the attachment site.
			The probe is attached too tightly and is obstructing blood circulation.	Reattach the probe.
			The probe is not attached to the patient properly.	Attach the probe to the patient properly.
			One of the following messages is displayed for 30 seconds. • LIGHT INTERFERENCE • CHECK PROBE SITE • DETECTING PULSE	Refer to each screen message section and remove the cause of the alarm or message.
*	Check Probe	SpO_2	The probe cable is disconnected from the SpO_2 connection cord.	Connect the probe cable to the SpO_2 connection cord. If SpO_2 monitoring is not necessary, touch the SILENCE ALARMS key.
			The probe is not attached to the patient. properly.	Attach the probe to the patient properly.
			The probe is broken or short-circuited.	Replace the probe with a new one. If the message still appears, replace the SpO_2 connection cord with a new one.
*	Check Probe Site	SpO_2	The probe is not attached at the appropriate site.	Attach the probe to a site 6 to 14 mm thick.
*	Check Sensor	TEMP	The probe is disconnected from the TEMP socket.	Connect the probe to the TEMP socket.
			The probe is damaged.	Replace the probe with a new one.
			The measured value is outside the measuring range	Check the probe attachment site.

	Screen Message	Parameter	Possible Cause/Criteria	Action
*	Communication Loss	System	Network is not connected.	Connect to network.
*	Connector Off	SpO$_2$	The probe cable is disconnected from the SpO$_2$ connection cord.	Connect the probe cable to the SpO$_2$ connection cord. If SpO$_2$ monitoring is not necessary, touch the SILENCE ALARMS key.
			The SpO$_2$ connection cord is disconnected from the SpO$_2$ socket.	Connect the SpO$_2$ connection cord properly. When SpO$_2$ monitoring is not necessary, touch the SILENCE ALARMS key to silence the alarm.
*	Cuff Occlusion	NIBP	The cuff pressure does not decrease after measurement has completed.	Check that the air hose is not bent or squeezed.
–	Detecting Pulse	SpO$_2$	The SpO$_2$ value cannot be obtained because the waveform is unstable.	Check the probe attachment.
			Poor blood circulation for measuring SpO$_2$.	Check the patient condition and probe attachment, or change the attachment site.
			The probe is secured too tightly and is obstructing blood circulation.	Reattach the probe.
			The probe is disconnected from the SpO$_2$ connection cord.	Connect the probe to the SpO$_2$ connection cord.
			The finger probe is not attached to the patient properly.	Attach the finger probe firmly to the patient.
–	Inflation Time Passed	NIBP	Venous puncture cuff inflation time has passed.	Restart venous puncture.
–	Insert Rec Paper	Recording	No recording paper.	Load the recording paper.
			The recording paper is not loaded correctly.	Correctly load the recording paper.
*	Light Interference	SpO$_2$	Too much light on the probe.	Remove light or cover the probe site with a blanket.
			Interference from surroundings.	Remove the interference.
			The probe attachment site is not appropriate.	Attach the probe to an appropriate site.

	Screen Message	Parameter	Possible Cause/Criteria	Action
–	Low Quality Signal	SpO$_2$	Considerable body movement.	When the message is displayed frequently, check the patient's condition and, if necessary, change the attachment site.
			The probe is not attached to the patient properly.	
*	Meas Timeout	NIBP	The measuring time exceeded the specified time due to noise.	Remove the cause if due to noise.
–	Remeasuring (Remeasurement is automatically performed. If the message still appears after remeasurement, do the counter actions.)	NIBP	The cuff is not attached to the patient.	Attach the cuff to the patient.
			Patient moved during measurement.	Wait for the patient to stop moving and then measure again.
			Patient's pulse is too weak.	Measure by palpation or the invasive blood pressure method.
			The cuff is not attached properly.	Attach the cuff properly.
			The cuff size is not appropriate.	Check that the cuff of the correct size is used.
			Patient's pulse and heart rate is unstable.	Wait for the patient to relax and stop moving.
*	Systolic Over	NIBP	The maximum blood pressure exceeded 280 mmHg when using the adult cuff, or 150 mmHg when using the neonate cuff.	Measure by palpation or invasive blood pressure measurement.
–	Weak Pulse	NIBP	The patient's pulse wave is too weak.	Measure by palpation or the invasive blood pressure method.
			The cuff is wrapped too loosely.	Wrap the cuff around the arm properly.
			The cuff size is inappropriate.	Use the appropriate cuff.
		SpO$_2$	Poor peripheral circulation.	Check the patient condition and change the attachment site.
			The probe is attached too tightly and is obstructing the blood circulation.	Reattach the probe.
–	Zeroing	NIBP	NIBP zero balance adjustment is being performed.	Do not touch the cuff during zeroing and wait for the message to disappear.

Monitoring

Trouble	Possible Cause/Criteria	Action
The screen is dark.	The brightness of the screen is not appropriate.	Adjust the setting on the Display/Sound window.
	The backlight is old.	Contact your Nihon Kohden representative.
	The monitor is operating on battery.	If necessary, set <Power Saving Mode> to OFF on the System Setup window.
No sync sound.	The sync sound setting is turned OFF.	Select ON for <Sync Sound Volume> on the Display/Sound window.
	The sync sound volume is turned down.	Adjust the volume setting on the Display/ Sound window.
	Sleep mode is turned on.	Sleep mode is turned off when: • The setting time is up. • The touch screen is touched. • The POWER key is pressed. An alarm occurs (Only when <EXIT SLEEP MODE ON CRISIS ALARM> on the Sleep Page of the System Setup window is set to ON.) Communication with CNS fails. (Network failure).
The monitor only operates for less than 5 hours with a fully charged battery.	The battery pack is old.	Replace the battery pack with a fully charged new one.
The remaining battery power on the battery status icon on the Home screen suddenly decreases.	The battery pack has been changed.	Fully charge and discharge the battery pack.
	The battery pack is old.	
The actual battery operation time is different than the battery status icon.	The battery pack has been changed.	
	The battery pack is old.	
Battery charging never ends.	The battery is inserted backward.	Insert the battery in the right direction.
The review data has been lost.	The monitor power was turned off by disconnecting the power cord.	When the monitor does not shut down correctly, review data for several minutes before power off is not saved. Press the POWER key to turn the power off. Refer to the "Turning the Monitor Off" section.
	The power cord was disconnected during shutdown operation.	
	The power cord was disconnected while the remaining battery power was too low.	

Network

Trouble	Possible Cause/Criteria	Action
The monitor cannot be connected to the network.	The network cable is not connected to the monitor properly.	Connect the network cable to the monitor properly.
	The network settings are not correct.	Set the correct network settings on the Network window of the System Configuration screen.
	The monitor is not selected as a monitored bed on the central monitor or receiving instrument.	Select the monitor as a monitored bed on the central monitor or receiving instrument.
	Discontinuity in the network cable or faulty hub.	Replace the network cable or the hub with a new one.
The monitor cannot be connected to the network with wireless communication.	Wireless LAN functionality is turned off on the vital signs monitor.	Set <WLAN> to ON in MENU ➡ Setup tab ➡ WLAN. For details, refer to the "Changing Settings" section.
	The vital signs monitor is out of range of the wireless network.	Move the vital signs monitor inside the range of the wireless network.
	Incorrect wireless LAN station setting.	Save the data in a compatible central monitor.
	Wireless LAN station failure.	Refer to the Operator's Manual for the wireless LAN station.
	The telemetry gateway setting is not correct.	Enter the correct telemetry gateway setting on the NETWORK window of the SYSTEM CONFIGURATION screen.

Recording

Trouble	Possible Cause/Criteria	Action
There is no printing (only paper feeding).	The recording paper is upside down.	Reload the recording paper into the recorder correctly.
Waveforms can be recorded but the trend and list recording cannot.	Dust in the sensor inside the recorder.	Clean the surface of the sensor inside the recorder with a dry cotton swab.
Printing is faint.	Nihon Kohden specified paper not used.	Use the FQW50-2-100 recording paper.
	The thermal head is dirty.	Clean the thermal head with the provided thermal head cleaning pen.
Dots are missing.	The thermal head is dirty.	Clean the thermal head with the provided thermal head cleaning pen.
Recording suddenly starts without key operation.	Alarm recording or periodic recording mode is set to ON.	Set the alarm recording or periodic recording to OFF on the Recording window if not needed. Touch the RECORD key on the screen to stop recording.
No paper is feeding.	The recorder door is open.	Push the recorder door closed until it clicks.
	Dust may have collected in the gears.	Contact your Nihon Kohden representative.
Recorder operates only some of the time.	Dust in the sensor inside the recorder.	Clean the surface of the sensor inside the recorder with a dry cotton swab.

NIBP

Trouble	Possible Cause/Criteria	Action
Cuff inflation pressure is less than 10 mmHg or NIBP data display disappears for a few seconds.	The cuff hose is not connected to the cuff socket properly.	Connect the cuff hose to the socket properly.
	The cuff is not wrapped around the arm or is wrapped too loosely.	Wrap the cuff around the upper arm.
The cuff does not inflate when the NIBP START/STOP key is touched.	The cuff hose or air hose may be folded or squeezed when the cuff pressure display on the screen increases quickly, but the actual cuff does not inflate.	Check the cuff hose and air hose.
Abnormal measurement results are displayed.	The cuff size is not correct.	Select the cuff which fits the patient's limb circumference.
	The cuff is not wrapped around the arm correctly.	Wrap the cuff around the upper arm, not too tightly or too loosely.
	NIBP data is not correct because of body movement.	Prevent the patient from moving during measurement.
	Measurement on the wrong site.	Measure NIBP at the correct site.
Auto measurement does not start even when the time interval has passed.	The time interval for the NIBP auto measurement is set incorrectly.	Set the correct time interval.
The cuff suddenly inflates.	The measurement mode is set to auto mode.	Check the time interval.
	Vital signs alarm occurred.	Set the NIBP Meas On Vital Alarm on the Main tab – NIBP page – Parameter window – System Setup window to OFF.
Cannot connect cuff to the air hose.	Unspecified cuff used.	Use a cuff specified by Nihon Kohden.
Cannot measure NIBP.	Noise interference which disables the calculation of blood pressure.	Remove the cause.
	The air hose is bent or squeezed.	Remove the cause.
	The cuff has worn out.	Use a new cuff.
NIBP data on the screen is dark or "---" appears.	The preset time elapsed from the last measurement.	When NIBP is measured again, the data is displayed in normal brightness.

SpO₂

Trouble	Possible Cause / Criteria	Action
Unstable SpO₂ value.	The probe size is inappropriate.	Use the correct size probe.
	The probe is attached to the same limb that is used for NIBP measurement.	Attach the probe to the other limb.
	An ESU is used.	Locate the ESU as far as possible from the probe and wait until the pulse wave stabilizes.
	Measuring on the venous pulse.	Cannot measure correctly.
SpO₂ value on the monitor and CO oximeter do not match.	The probe is not attached properly.	Attach the probe correctly. (The emitter and detector of the probe must face each other.)
	The attachment site is inappropriate.	Attach the probe to a site of 6 mm to 14 mm thick.
	The measuring site is not clean.	If necessary, remove nail polish and clean the measuring site.
	Too much abnormal hemoglobin (HbCO, MetHB, etc.).	Cannot measure correctly.
	Dye (methylene blue or indocyanine green) is injected in the blood.	
	Measuring during CPR.	
No SpO₂ data on the screen when using Masimo probe.	SpO₂ probe and/or connection cord other than specified is used.	Only use the specified SpO₂ probe and connection cord.
	The probe is not connected to the connection cord correctly.	Connect the probe to the connection cord with the logo labels facing the same direction.
No SpO₂ data on the screen when using Nihon Kohden probe.	The JL-500P1 or JL-500P2 SpO₂ adapter is disconnected from the monitor or probe.	Connect the SpO₂ adapter to the monitor and probe.

Temperature

Exergen Sensor

Trouble	Possible Cause/Criteria	Action
The temperature value is not displayed on the screen.	The temperature probe is faulty or dirty.	Clean the temperature probe.
	Monitor malfunction.	Contact your Nihon Kohden representative.
	The temperature probe is disconnected from the temperature socket.	Connect the temperature probe to the temperature socket properly.
	The temperature probe is connected to the Network socket.	Connect the temperature probe to the temperature socket.
	An incompatible temperature probe is connected to the temperature socket.	Connect a temperature probe which is compatible with the bedside monitor. If the problem is not solved, contact your Nihon Kohden representative.
The temperature value displayed on the LCD is different from the one displayed on the screen of the monitor.	Noise interference.	Remove the noise source. Relocate the sensor.

Covidien Sensor

Trouble	Possible Cause/Criteria	Action
Cannot measure temperature.	When another working temperature probe is connected to the input jack but the temperature value does not appear.	Replace the probe.
	When connecting to the LAN jack, the temperature value does not appear.	Connect the probe to the temperature input jack.
Out of Range	When the probe is not in contact with the patient, it will be out of range.	Confirm the probe is in contact with the patient.
	When the temperature value is too high or low, it will be out of range.	Confirm the temperature of the patient is in proper range.
Module Error	When the Covidien Board has an error, it will say "Module Error".	Replace the Covidien Board.
Probe Error	When the probe has an error, it will say "Probe Error".	Replace the probe.

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