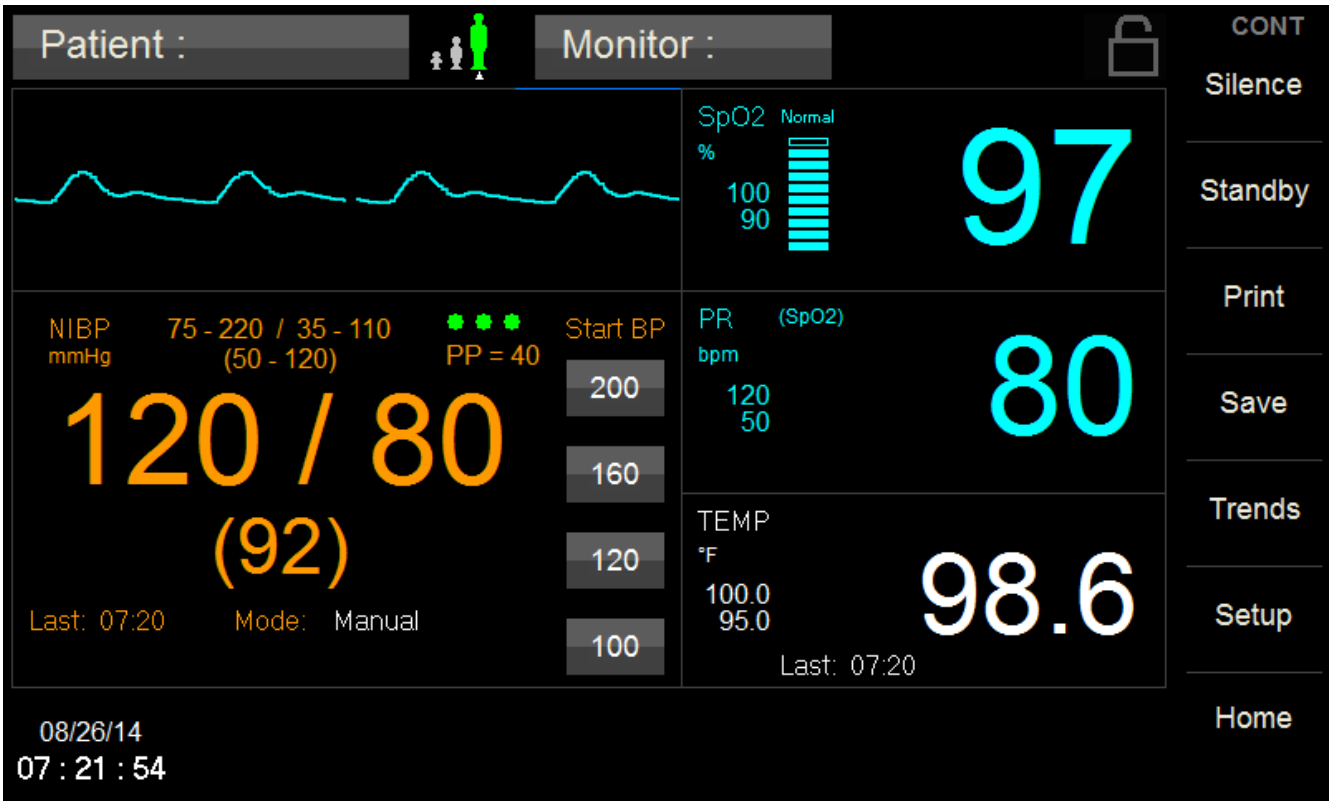
740 SELECT™



Multi-Parameter Monitor

User Manual Addendum - Exergen Temperature

ZOE Medical

This User Manual Addendum describes the features and operations of the 740 SELECT Multi-Parameter monitor: Software Version 5.0 or above.

1. OVERVIEW

TRADEMARKS

Trademarked names appear throughout this document. Instead of inserting a trademark symbol with each mention of the trademarked name, the publisher states that it is using the names only for editorial purposes and to the benefit of the trademark owner with no intention of improperly using that trademark.

ZOE Medical is a registered trademark of Zoe Medical, Inc.

740 SELECT ™ is a trademark of Zoe Medical, Inc.

TemporalScanner™ is a trademark of Exergen Corporation

AHB™ is a trademark of Exergen Corporation

Refer to the 740 SELECT User Manual, Zoe Medical PN 21-22-0316, for a list of trademarks.

CONTACT ADDRESSES

Zoe Medical, Inc.
460 Boston Street
Topsfield, MA 01983 U.S.A.

Phone:

(978) 887-4013

Fax:

(978) 887-1406

E-Mail:

customersupport@zoemedical.com

Web:

www.zoemedical.com

CONVENTIONS USED IN THIS MANUAL

Warning: Directions that warn of conditions that put the patient or the caregiver at risk.

Caution: Directions that help to avoid damaging the monitor or losing data.

Note: Directions that make it easier to use the monitor.

IMPORTANT:

Read the 740 SELECT User Manual, Zoe Medical PN 21-22-0316 carefully before patient use of the monitor.

This Manual addresses the optional Exergen Temperature (Temp) parameter of the 740 SELECT monitor.

Read this Manual carefully before patient use of the monitor.

Zoe Medical reserves the right to make changes to this Manual and improvements to the product it describes at any time without notice or obligation.

REVISION HISTORY

This Manual has a revision number located at the bottom of each page. It changes whenever the Manual is updated.

Rev A	January 2016
Rev B	April 2019
Rev C	April 2020
Rev D	October 2021

WARRANTY

Refer to the **740 SELECT** User Manual, Zoe Medical PN 21-22-0316, for full Warranty Policy for Zoe Medical **740 SELECT** monitor. In all cases, policy applies from date of purchase from Zoe Medical or its authorized distributors or agents.

Exergen Temp scanner:	1 year through Zoe Medical, Lifetime through Exergen
Exergen Temp scanner cable:	1 year

TABLE OF CONTENTS

FIGURES

TABLES

2. INTENDED USE AND INTRODUCTION

INTENDED USE

Full Indications for Use and Contraindications may be found in the 740 SELECT User Manual, Zoe Medical PN 21-22-0316.

The **740** SELECT monitor with Exergen Temp scanner is indicated for use in adult, pediatric and infant or neonatal patient populations.

The **740** SELECT monitor with Exergen Temp scanner facilitates the monitoring of a patient's Temperature via a temporal scanner.

INTRODUCTION

The Exergen Temporal Scanner Thermometer has the capability of taking Temporal Artery (TA) Temperature in about 3 seconds. The Exergen Temp scanner has the ability to measure the patient's Arterial temperature in °F or °C.

The Exergen Temp scanner can be connected to the **740** SELECT monitor in 2 different ways. The Model TAT-5000S-RS232 Thermometer is integrated into the side panel of the device at the factory. In newer models of the **740** SELECT monitor, the Model TAT-5000S-USB Thermometer is connected to the USB port at the rear of the device. Otherwise, these Exergen models are identical in their form and function.

3. ASSEMBLY

Note: Refer to the Directions for Use enclosed with the Exergen Temp scanner for additional information.

INITIAL ASSEMBLY – EXERGEN MODEL TAT-5000S-USB

To complete the assembly of the 740 SELECT monitor for use with the Exergen Temp scanner with USB Connector, perform the following steps:

- Connect the pre-attached USB cable from the Exergen Temp scanner to the USB port on the rear of the 740 SELECT monitor.

Note: The Exergen Temp scanner with USB connector is not supported in 740 SELECT monitor units with a manufacture date of June 2020 or earlier. The manufacture date can be found on the rear label of the unit.

INITIAL ASSEMBLY – EXERGEN MODEL TAT-5000S-RS232

To complete the assembly of the **740 SELECT** monitor for use with the Exergen Temp scanner with RS232 Connector, perform the following steps:

- Connect the pre-attached cable from the monitor to the Exergen Temp scanner (see CONNECTING INTERFACE CABLE TO SCANNER below).
- Install the plastic cradle for the Exergen Temp scanner into the side of the monitor (see INSTALLING SCANNER CRADLE TO MONITOR below).

Once these assembly steps have been completed, read this manual and perform a Temp measurement as outlined in TAKING A EXERGEN TEMPERATURE on page 24 to verify proper operation of the monitor.

Caution: Do not open the monitor to repair it. Contact Zoe Medical for service needs. Refer to page 3 for email and phone number information.

CONNECTING INTERFACE CABLE TO SCANNER

The cable that connects to the Exergen Temp scanner is pre-attached to the monitor at the factory. To connect the Exergen temporal scanner to this cable, perform the following steps (refer to Figure 1 below):

1) Remove the bag with scanner cable from side of monitor, discard bag.
2) Insert the cable into the bottom end of the scanner - Note the orientation of slots on plug and notch on the top of the opening at the bottom of the scanner.
3) Push in the cable until it clicks.
4) Gently pull on the cable to ensure proper insertion of connector into the socket.

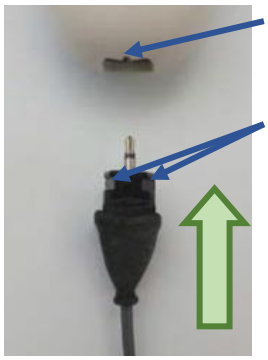


Figure 1: Inserting cable into Exergen Temp scanner

INSTALLING SCANNER CRADLE TO MONITOR

The cradle to hold the Exergen Temp scanner when not in use, needs to be attached to the Temp module. To connect the cradle to the Temp module, perform the following steps (refer to Figure 2 below):

1. Position the cradle so that the cradle tabs align with the Temp module slot
2. Gently push the cradle fully into the Temp module slot
3. The ears on the cradle tabs should engage and click should be heard
4. Gently pull on the cradle to ensure proper insertion of cradle into temp module

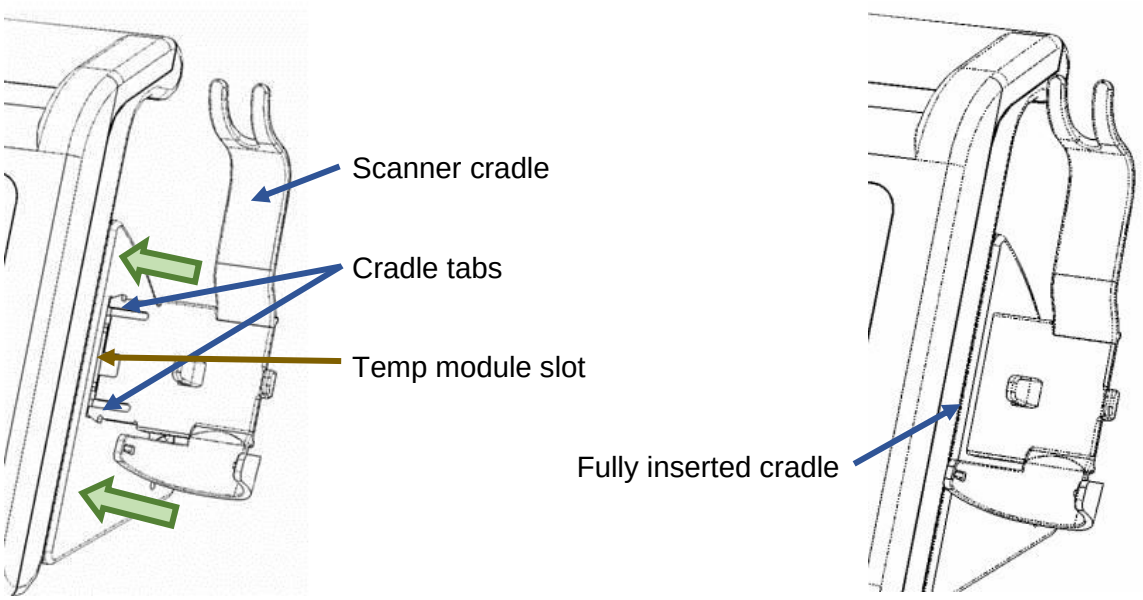


Figure 2: Inserting Temp scanner cradle into right side of monitor

4. MONITOR OPERATION

REAR PANEL

Figure 3: Rear Panel View with Exergen Temp (RS232 Connector)

Figure 4: Rear Panel View with Exergen (USB Connector)

Note: The serial number label is located on the back side of the monitor.

RIGHT SIDE VIEW

Refer to Figure 5:

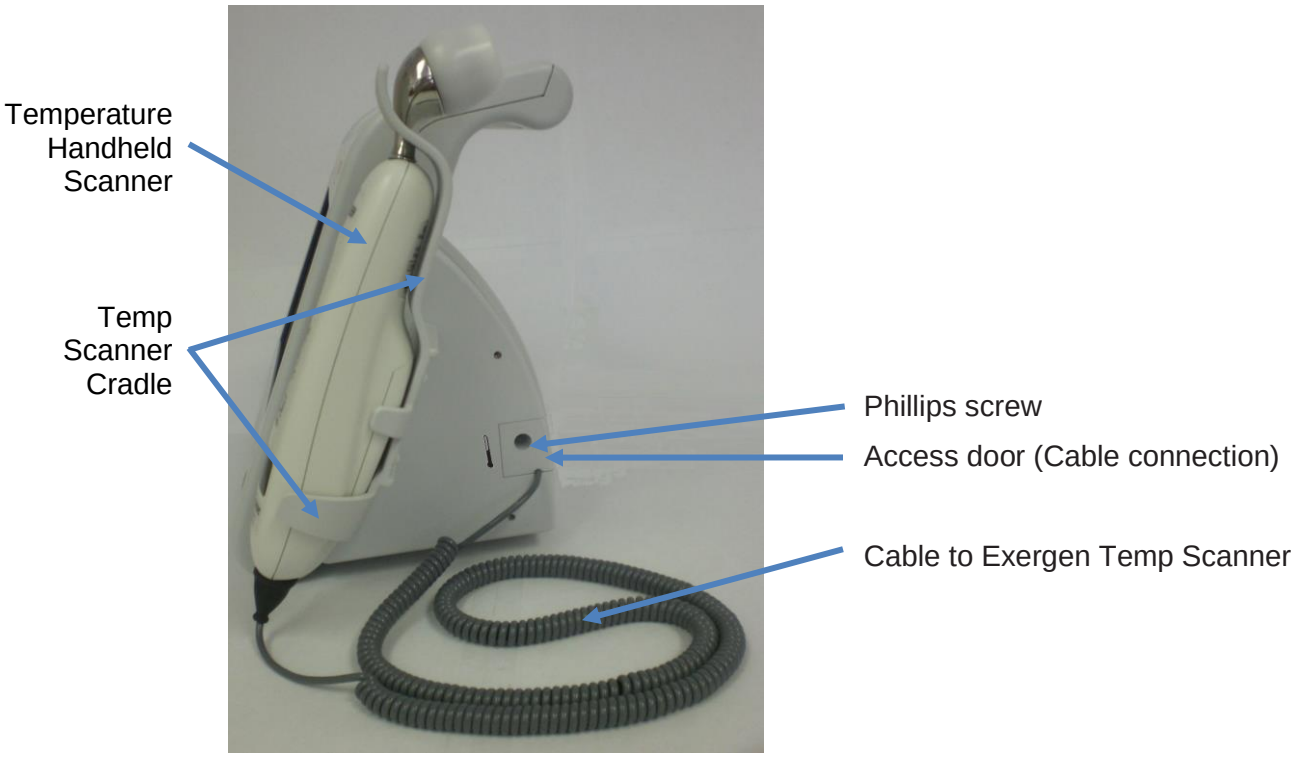


Figure 5: Right Side Panel View with Exergen (RS232 Connector)

REMOVE EXERGEN TEMP SCANNER (EXERGEN MODEL TAT-5000S-RS232)

Store the Exergen Temp scanner in its cradle when not in use.

Perform the following to remove the Exergen Temp scanner from the monitor (Refer to Figure 6):

1. Pivot the Temp scanner up away from the clips ①; and
2. Lift the Temp scanner's probe over the fingers ② of the cradle.

To store the Temp scanner in the cradle, reverse this procedure.

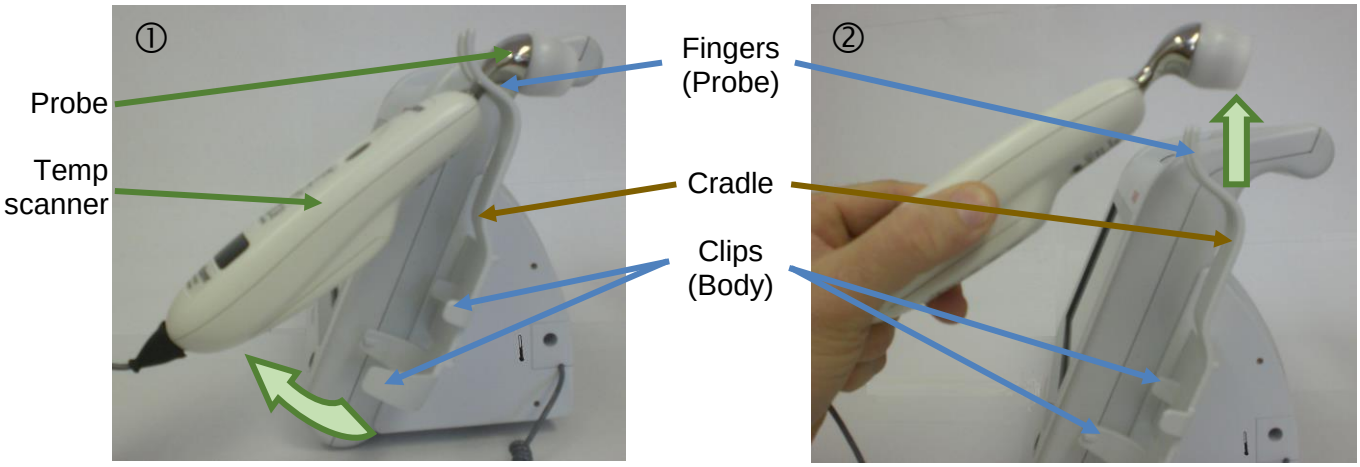


Figure 6: Removing the Temp scanner from its cradle (RS232 Connector)

Note: Ensure that the temp scanner is secured in its cradle during transportation. The temp scanner's probe should be securely placed between the fingers and the temp scanner body should gently seat into the clips of the cradle.

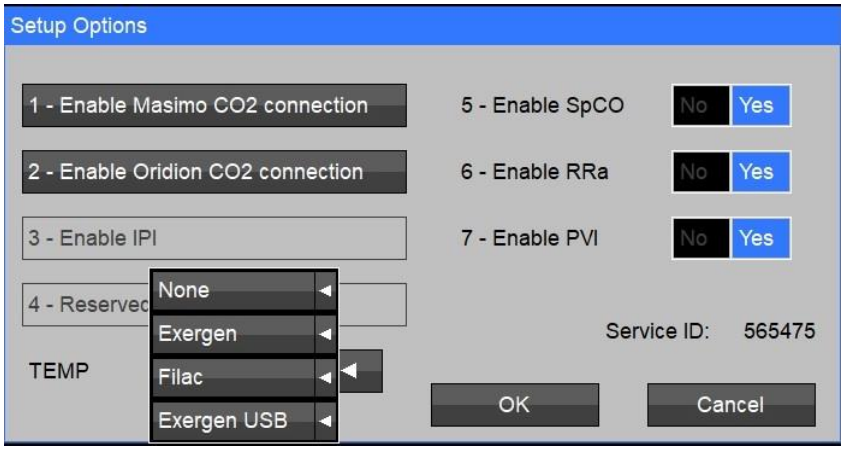
MONITOR OPERATING INSTRUCTIONS

TEMPERATURE NUMERIC FIELD

Figure 7: Temp Numeric Field

TEMPERATURE TYPE SETTING

The **740** SELECT monitor needs to be configured for the type of Exergen Temp scanner that is being used. In the password-protected Service menu, in the Options sub-menu, the TEMP setting is used for this configuration. When the Exergen Temp scanner model TAT-5000S-RS232 is connected to the monitor, the TEMP setting must be set to “Exergen”. When the Exergen Temp scanner model TAT-5000S-USB is connected to the monitor, the TEMP setting must be set to “Exergen USB”. If there is a change in the setting, then the monitor must be power-cycled after leaving the menu, in order for the change to take effect.



ALARM LIMITS AND SETTINGS

Touching an individual parameter cell will open a Setup screen to enable the setting of alarm limits or settings specific to that parameter. Setup screens are available for each installed parameter.

SETUP EXERGEN TEMP

To access the Setup Temperature screen, touch anywhere within the Temperature cell to open the Setup Temperature window (refer to Figure 8).

From the Setup Temperature screen you may set the following:

- Lower and Upper temperature alarm limits
- Choose to select Auto set alarm limits (“Auto” set alarm limits are based on the current measured value displayed on screen)

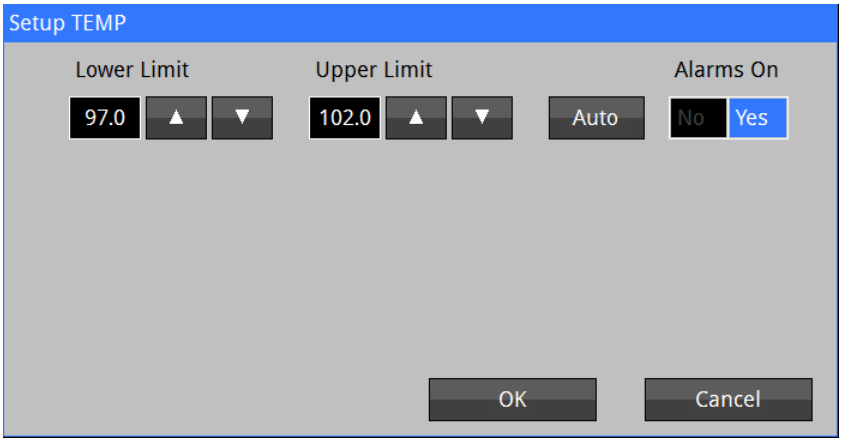


Figure 8: Exergen Temperature Setup Screen

To change Alarm Limits, use the Up/Down arrows. The adjacent dialog box adjacent will note your current selection.

Choose to enable or disable the Temperature alarms using the Alarms On function. Select No to disable the alarm. Select Yes to enable the alarm.

Select OK to confirm your selection(s) and close the Setup Temperature window and return to the main display screen. Current selections (as applicable) will now appear within the Temperature cell.

Select Cancel anytime to return to the main display without making any changes.

SETTING MONITOR TEMP UNITS

The Temperature readings can be displayed in either the Celsius or Fahrenheit units (refer to Figure 9 and Figure 10).

To configure the monitor's temperature units complete the following steps:

1) Select **Setup**, followed by the **Administrator**, **System**
2) Enter the required password 986.

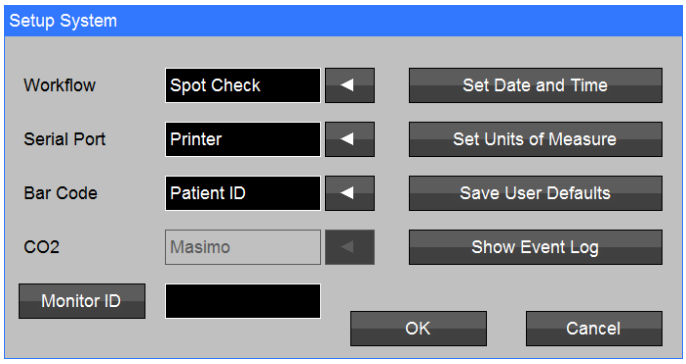


Figure 9: Setup System Screen

3) Select **Set Units or Measure** button

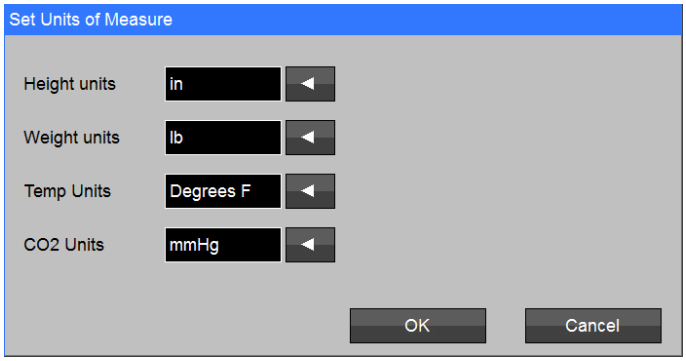


Figure 10: Set Units of Measure Screen

4) From the Temp Units drop down menu, select the desired temperature units. The selected units will appear in the dialog box.

Note: If the monitor and Exergen Temp scanner units are each set to a different Temp unit (e.g., one °F and the other °C), the monitor will automatically switch to the Temp units set in the Exergen Temp scanner, once a valid temperature measurement has been completed. To change the units in the Exergen scanner Temp follow the SETTING EXERGEN SCANNER TEMP UNITS procedure outlined on page 32.

5) Select OK to confirm the selection and close the window.

CONFIGURATION

Select **Administrator** to enter Setup Administrator menu then select **Configuration** to enter the Setup Configuration window (refer to Figure 11) to review the Model Type, monitor serial number, and current monitor software version of its operating system and that of the internal modules as applicable (NIBP, SpO_2, Temperature, etc.).

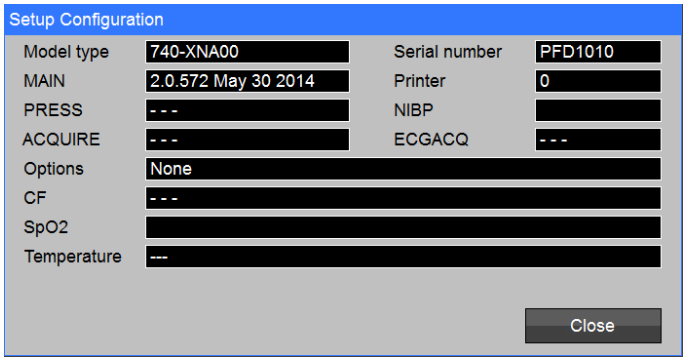


Figure 11: Setup Configuration Screen (Example only)

Note: The Software Version for the Exergen Temp scanner will only appear if the scanner is properly connected to monitor and the scanner Start button has been pressed.

TEMP MESSAGES [1] ON MONITOR DISPLAY

Message	Parameter Value	Possible Cause	Suggested Action
Internal error	---	• Temp problem detected	• If message persists, contact Zoe Medical technical support
Fatal battery error	---	• Temp problem detected	• If message persists, contact Zoe Medical technical support
Patient temperature too high to measure	---	• Temp out of range (too high)	• Check the patient and provide any necessary clinical care • Take measurement as described in TAKING A EXERGEN TEMPERATURE • If message persists, contact Zoe Medical technical support
Patient temperature too low to measure	---	• Temp out of range (too low)	• Check the patient and provide any necessary clinical care • Take measurement as described in TAKING A EXERGEN TEMPERATURE • If message persists, contact Zoe Medical technical support
Ambient temperature too high to measure	---	• Temp probe too warm	• Make sure the room temperature is within the operating temp of the temp scanner • Allow the temp scanner to come to room temperature (~30 min) • If message persists, contact Zoe Medical technical support
Ambient temperature too low to measure	---	• Temp probe too cold	• Make sure the room temperature is within the operating temp of the temp scanner • Allow the temp scanner to come to room temperature (~30 min) • If message persists, contact Zoe Medical technical support
Temp < [lower limit]	[number]	• The patient's temperature has fallen below the current lower alarm limit	• Check the patient and provide any necessary clinical care • Change the alarm limit if it is no longer clinically appropriate
Temp > [upper limit]	[number]	• The patient's temperature has risen above the current upper alarm limit	• Check the patient and provide any necessary clinical care • Change the alarm limit if it is no longer clinically appropriate

Table 1: Temp Messages on the Display

1 Refer to Table 3 for the conditions that may occur while the Exergen Temp scanner is in use, and the associated indications.

5. TEMPERATURE MONITORING

Note: The following Warnings and Cautions are directed toward the Exergen Temporal scanner monitoring function. Additional Warnings and Cautions are found in the **740** SELECT User Manual, Zoe Medical PN 21-22-0316.

WARNINGS

Warning: No modification of this equipment is allowed.

Warning: Do not use this thermometer if it is not working properly, if it has been exposed to temperature extremes, damaged, been subject to electrical shocks or immersed in water.

Warning: Not suitable for use in the presence of flammable anesthetic mixtures.

Warning: Do not take temperature over scar tissue, open sores or abrasions.

CAUTIONS

Caution: Use this product only for its intended use as described in this manual.

Caution: The operating environmental temperature range for this product is 60 to 104°F (15.5 to 40°C).

Caution: Always store this thermometer in a clean, dry place where it will not become excessively cold (-4°F/-20°C), or hot (122°F/50°C) or humid (max RH 93% non-condensing, at 50 to 106 kPa).

Caution: The thermometer is not shockproof. Do not drop it or expose it to electrical shocks.

Caution: Do not Autoclave. Please note cleaning and sterilizing procedures in this manual.

Caution: There are no parts that you can service yourself except for the battery, which you should replace when low by following the instructions in this manual. For service, repair, or adjustments, return your thermometer to Exergen

Caution: Never drop or insert any object into any opening, unless stated in this manual.

Caution: If your thermometer is not used regularly, remove the battery to prevent possible damage due to chemical leakage.

Caution: Disposal of used Exergen scanner must be performed in accordance with current medical practices or local regulations regarding disposal of infectious, biological medical waste.

Caution: Follow the battery manufacturer's recommendations or your hospital policy for the disposal of used batteries.

There are no internal parts you can service yourself except for the replacing the scanner battery and/or interface cable. You may replace the battery when the low battery message appears by following the instructions in this manual. You may replace the Exergen Scanner cable when it has been damaged by following the instructions in this manual.

Contact the Zoe Medical Customer Service Department for service, examination, repair, or adjustments of your temp scanner. Refer to page 3 for email and phone number information.

OVERVIEW

The Exergen Temp scanner is an infrared thermometer designed for accurate, completely non-invasive temperature assessment by scanning the temporal artery (TA).

Temperature is measured by gently stroking the Exergen Temp scanner across the forehead, and includes a momentary touch of the probe to the neck area behind the ear lobe, to account for any cooling of the forehead as a result of diaphoresis. The patented arterial heat balance technology (AHB™) automatically measures the temperature of the skin surface over the artery and the ambient temperature. It samples these readings some 1000 times a second, ultimately recording the highest temperature measured (peak) during the course of the measurement. The Exergen Temp scanner emits nothing - it only senses the natural thermal radiation emitted from the skin.

It has been clinically proven in premier university hospitals to be more accurate than ear thermometry, and better tolerated than rectal thermometry, and is supported by more than 50 peer-reviewed published studies covering all ages from premature infants to geriatrics in all clinical care areas. It is a superior method for patient and clinician alike.

A 40-page compendium on Temporal Artery Temperature Assessment is available at www.exergen.com/medical/PDFs/tempassess.pdf, and a complete list of peer-reviewed published clinical studies is available at www.exergen.com/c. Complete multilanguage information on clinical use, instruction manuals, and training is available at www.exergen.com/s, which includes links to a specialized clinical site http://www.exergen.com/tathermometry/index.htm.

The link to www.exergen.com/s appears on the front label of the instrument as a scannable "QR" symbol for easy linking to the site.

exergen.com/s

TEMPERATURE ALARM LIMITS

There are three sets of alarm limit parameters, one for Adult, Pediatric and Neonatal. Alarm Limits will operate on the parameters for the current monitor patient mode. Temperature alarms are disabled by default.

To set the TEMP Alarm limits:

1) Touch the TEMP Numeric field.
2) Set Alarms On to Yes to enable TEMP alarms, or No to disable TEMP alarms.

Warning: If Alarms On is set to "No" the monitor will not generate any visual or audible indication of an alarm condition for TEMP.

3) Adjust the desired TEMP Upper or Lower Limit value:
   - The Upper and Lower Alarm Limits can be adjusted independently.
4) Touch **OK** to accept or **Cancel** to ignore the selection.
5) Touch the **Home** button to return to the Main screen.

Caution: Switching modes from Adult, Pediatric or Neonate to any other patient mode, shall recall the last stored values for the patient alarm limits.

Note: Alarms for Temp values are produced at the time the measurement is taken.

Note: To change the Temperature units, refer to SETTING EXERGEN SCANNER TEMP UNITS on page 32.

Note: If the monitor and Exergen Temp scanner units are each set to a different unit (e.g., one °F and the other °C), the monitor will automatically switch to the Temp units set in the Exergen Temp scanner, once a valid temperature measurement has been completed.

INTRODUCTION TO TA THERMOMETRY

Temporal artery thermometry (TAT) is a completely new method of temperature assessment, using infrared technology to detect the heat naturally emitting from the skin surface. In addition, and of key importance, this method incorporates a patented arterial heat balance system to automatically account for the effects of ambient temperature on the skin. Refer to Figure 12.

This method of temperature assessment has been shown to improve results and reduce costs by non-invasively measuring body temperature with a degree of clinical accuracy unachievable with any other thermometry method.

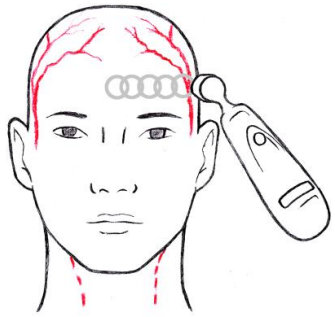


Figure 12: Forehead scan

How does the temperature from a temporal scanner relate to core temperature?

Temporal artery temperature is considered a core temperature because it has been demonstrated as accurate as the temperature measured by a pulmonary artery and esophageal catheter, and as accurate as a rectal temperature on a stable patient. Rule of thumb: Rectal temperature is about 1°F (0.5°C) higher than an oral temperature and 2°F (1°C) higher than an

axillary temperature. It will be easy to remember if you think of core temperature as a rectal temperature, and apply the same protocol you would use for a rectal temperature.

USING THE EXERGEN TEMP SCANNER

- **To Scan:** Depress the ON button (Refer to Figure 13). The instrument will continually scan for the highest temperature (peak) as long as the ON button is depressed.
- **Clicking**: Each fast click indicates a rise to a higher temperature, similar to a radar detector. Slow clicking indicates that the instrument is still scanning, but not finding any higher temperature.
- **To Retain or Lock Reading**: The reading will remain on the LED display for 30 seconds after button is released (Refer to Figure 13). If measuring room temperature, the temperature will remain on the LED display for only 5 seconds.
- **To *Restart***: Depress the ON button to restart (Refer to Figure 13). It is not necessary to wait until the LED display is clear, the thermometer will immediately begin a new scan each time the ON button is depressed.

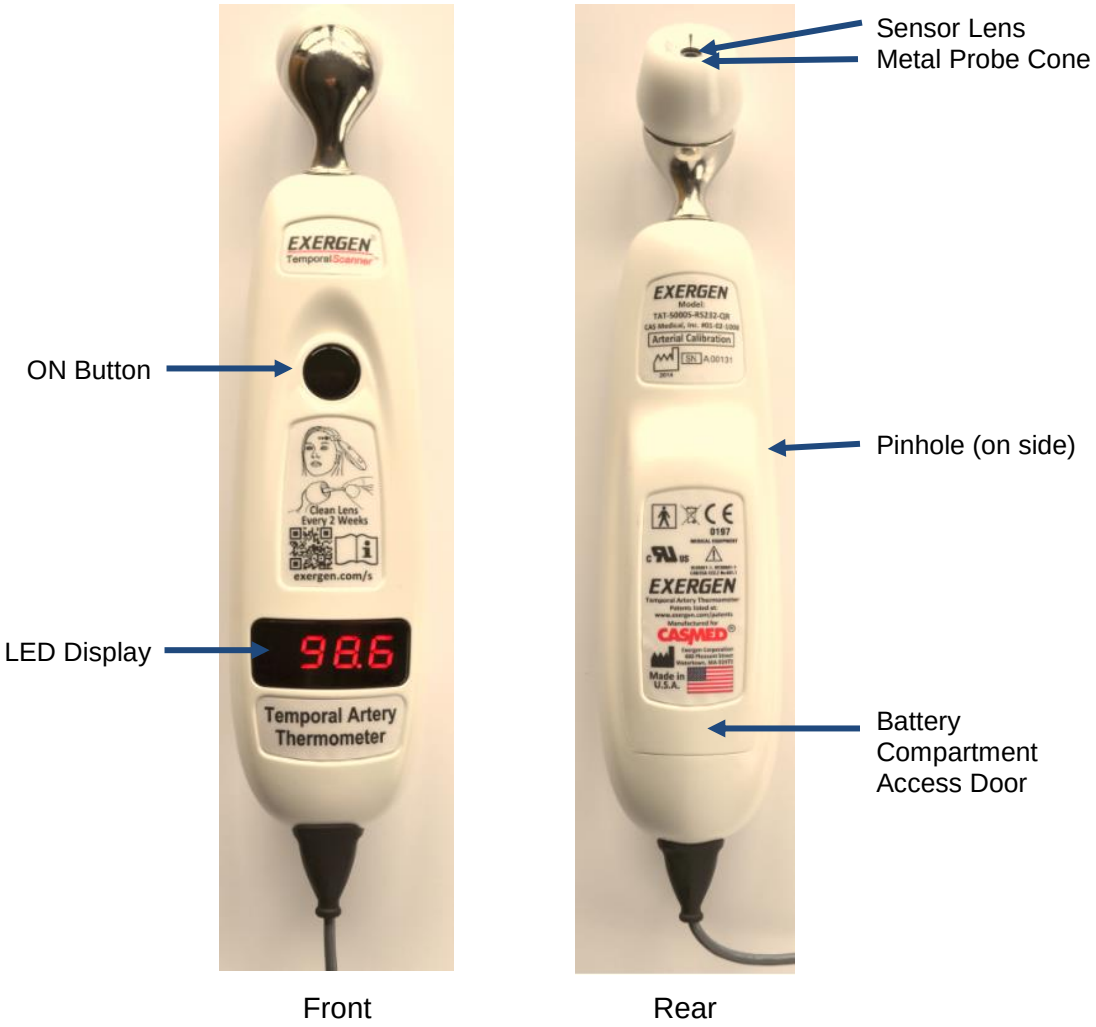


Figure 13: Views of Exergen Temp scanner

Alternate sites when temporal artery or behind ear are unavailable:

- Femoral artery: slowly slide the scanner across groin.
- Lateral thoracic artery: slowly scan side-to-side in the area ~midway between the axilla and the nipple.

TAKING A EXERGEN TEMPERATURE

Measure only the side of the head exposed to the environment. Anything covering the area to be measured (hair, hat, wig, bandages, etc.) would insulate the area, resulting in falsely high readings.

Slide the thermometer straight across the forehead, not down the side of the face. Midline on the forehead, the TA is about a millimeter below the skin, whereas at the side of the face, the TA is much deeper, and measuring there would result in falsely low readings.

Wait about 30 seconds before measuring the same person again to avoid excessive cooling of the skin.

An infant is frequently swaddled in blankets and clothing covering the neck area. Unless visible sweating, one measurement at the TA area is typically all that is required. Should you feel the temperature is low, then push aside any clothing or blankets covering the neck area for ~30 seconds or so, and repeat the measurement on the neck behind the ear.

FACTORS THAT MAY AFFECT MEASUREMENT ACCURACY

SWEATING

When a fever resolves, the body may bring its temperature down by sweating. The temp scanner detects this reduction in temperature immediately. However, sweating also causes extra cooling of the skin. As a result, the reading given by the temp scanner may be low. You should therefore either wait until the sweating has stopped (wiping of the forehead is not recommended, since the sweating immediately begins again), or use the following method:

1. Scan the temperature as normal, keeping the button depressed
2. Gently nestle the temp scanner on the neck directly behind the ear lobe
3. Release the button and read the temperature

The artery behind the ear lobe does not provide a sufficiently accurate reading. However, this area is less affected by sweating than the forehead. In addition, during sweating, increased blood flow produces higher skin temperatures, equivalent to TA temperature, resulting in a good reflection of body temperature.

ENVIRONMENTAL EFFECTS

The temp scanner measures the temperature of the surrounding environment. For this measurement to be accurate, it needs to have become acclimated to the temperature of the room in which it is to be used.

Caution: Allow the temp scanner to acclimate for at least 30 minutes before using it if it is taken from a cold room into a hot room, or vice versa

Avoid holding the temp scanner by the probe as it will mistake the temperature of your hand for that of the room.

MOVEMENT

If the patient is agitated, or squirms away before you have completed your measurement, just keep the button depressed and you can continue the measurement without having to wait

ADULT TEMPERATURE MEASUREMENT

Follow this procedure to take an Adult temperature:

1. **Step 1 - Remove temp scanner from cradle:**
   - Gently tilt the temp scanner up from the bottom of the cradle.
   - Lift the temp scanner's probe over the cradle's fingers (probe) - refer to Figure 6.
2. **Step 2 - Slide across forehead:**
   - Place probe flush on center of forehead and depress ON button.
   - Keeping ON button depressed slowly slide probe mid-line across forehead to the hair line.

     Refer to Figure 14 (a).

(a)

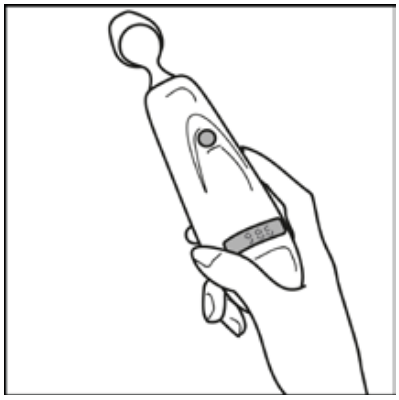
3. **Step 3 - Slide behind ear:**
   - Keeping ON button depressed, lift probe from forehead, touch behind ear halfway down the mastoid process and slide down to the soft depression behind the earlobe.

     Refer to Figure 14 (b).

(b)

4. **Step 4 - Read Temp**
   - Release ON button.
   - Remove from head.
   - Read value on probe or monitor.

     Refer to Figure 14 (c).



(c)

Figure 14: Adult Temp Steps

5. **Step 5 - Return temp scanner back to cradle (or when not in use)**
   - Lay the temp scanner probe into the cradle's fingers (probe) - refer to Figure 6.
   - Gently lay the temp scanner down into the bottom of the cradle.
   - The temp scanner may be gently pushed into the cradle until the retaining clips are engaged around the body of the temp scanner.

HOW TO IMPROVE ACCURACY OF ADULT MEASUREMENTS

Non-insulated forehead

- Measure only the up-side on a patient in a lateral position.
- The down-side will be insulated preventing the heat from dissipating, resulting in falsely high readings.
- Refer to Figure 15 (a).

Think of a sweatband

- Measure straight across the forehead and not down the side of the face.
- At the mid-line, the temporal artery is about 2 mm below the surface, but can go deeply below the surface on the side of the face.
- Refer to Figure 15 (b).

Measure exposed skin

- Brush the hair and bangs aside if covering the area to be measured.
- Refer to Figure 15 (c).

(a)

(b)

(c)

Figure 15: Improving Adult Temp Accuracy

INFANT TEMPERATURE MEASUREMENT

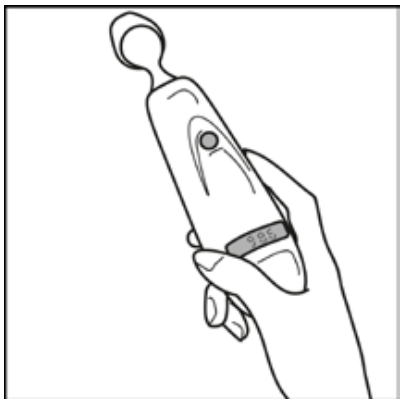
Follow this procedure to take an Infant temperature:

1. **Step 1 - Remove scanner from cradle:**
   - Gently tilt the temp scanner up from the bottom of the cradle.
   - Lift the temp scanner probe over the cradle's fingers (probe) - refer to Figure 6
2. **Step 2 - Place across forehead**
   - Place probe flush on center of forehead and depress ON button.
   - Keeping ON button depressed, slowly slide probe mid-line across forehead to the hair line.

     Refer to Figure 16 (a).
3. **Step 3 - Read Temp**
   - Release ON button.
   - Remove from head.
   - Read value on probe and monitor**.**

     Refer to Figure 16 (b).

(a)



(b)

Figure 16: Infant Temp Steps

4. **Step 4 - Return scanner back to cradle (or when not in use)**
   - Hook the temp scanner probe to the cradle's fingers (probe) - Refer to Figure 6.
   - Gently lay the temp scanner down into the bottom of the cradle.
   - The temp scanner may be gently pushed into the cradle until the retaining clips are engaged around the body of the temp scanner.

HOW TO IMPROVE ACCURACY OF INFANT MEASUREMENTS

Preferred site:

- The preferred site is the temporal artery area.
- Unless visibly diaphoretic, one measurement here is typically all that is required.
- Refer to Figure 17 (a).

(a)

Alternate site:

- If the temporal artery is covered, then the area behind the ear, if exposed, can be an alternate site.

  Refer to Figure 17 (b) & (c).

(b)

- Measure straight across the forehead and not down side of face.
- At mid-line, the temporal artery is about 2 mm below the surface, but can go deeply below the surface on the side of the face.

(c)

- Brush the hair aside if covering the area to be measured.
- The Measurement site must be exposed.

  Refer to Figure 17 (d).

(d)

Figure 17: Improving Infant Temp Accuracy

What should I do if I get an abnormally high or low reading, how do I confirm my reading?

- Repeat the reading with the same Temp scanner; a correct reading will be reproducible.
- Repeat the reading with another Temp scanner. Two Temp scanners with the same reading will confirm the reading.
- Sequential readings on the same patient in rapid succession will cool the skin; it is best to wait about 30 seconds for the skin to recover from the cold probe.
- Refer to Table 2 for Possible Causes of Abnormal Exergen Temp Readings.

Type of abnormal Temperature	Possible cause	Helpful hint
Abnormally low Temperature	Dirty Lens.	Clean lens of scanner every two weeks.
	Releasing the button before finished measuring.	Release the button after finished measuring.
	Measuring when an ice pack or wet compress is on the forehead.	Remove ice pack or wet compress, wait 2 minutes, and re-take temperature.
	Measuring a completely diaphoretic patient.	Complete diaphoresis includes diaphoresis of area behind the ear and suggests that the temperature is rapidly dropping. Use an alternative method of temperature measurement in these cases until the patient is dry and the temporal artery measurement can be repeated.
	Improperly scanning down the side of the face.	Scan straight across forehead. The temporal artery is closest to skin in that area.
Abnormally high temperature	Anything covering the area to be measured would insulate and prevent heat from dissipating, resulting in false high readings.	Confirm measurement site has not recently been in contact with heat insulators such as hats, blankets, and hair. Scan the area not covered or wait about 30 seconds for the previously covered area to equilibrate to the environment.

Table 2: Possible Causes of Abnormal Exergen Temp Readings

.

EXERGEN SCANNER DISPLAY DIAGNOSTICS

Table 3 summarizes the conditions that may occur while the Exergen Temp scanner is in use, and the associated indications:

Condition	LED Display	Range
High Target	HI	>110 °F (43 °C)
Low Target	LO	< 61 °F (16 °C)
High Ambient	HI A	>104 °F (40 °C)
Low Ambient	LO A	< 60 °F (16 °C)
Condition	**LED Display**	**Explanation**
Low Battery	bAtt	When Low Battery (bAtt) condition first appears, approx. 10-20% of battery life remains (or ~100 readings)
No or Very Low Battery	blank display	
Processing Error	Err	Restart. Return for repair if error message persists
Scanning (Normal Operation)	- - - -	

Table 3: Exergen Diagnostic Messages

SETTING EXERGEN SCANNER TEMP UNITS

Note: If the monitor and Exergen Temp scanner units are each set to a different unit (e.g., one °F and the other °C), the monitor will automatically switch to the Temp units set in the Exergen Temp scanner, once a valid temperature measurement has been completed.

Follow this procedure to change the temp scanner Temp LED display units:

1) Insert a pointed object (e.g., the end of straightened paperclip) into the hole on the right rear of the temp scanner (looking at the back of the temp scanner). Refer to Figure 18.
2) Pushing in and release the battery compartment access door.
3) Remove the battery compartment access door from the temp scanner.
4) Remove the 9V battery from the temp scanner battery compartment - There is no need to disconnect the battery from the temp scanner.
5) Locate the F/C switch, and slide to desired display temp units: °C or °F (marked on the switch).
6) Reinstall the 9V battery back into the temp scanner battery compartment.
7) Reinstall the battery compartment access door.

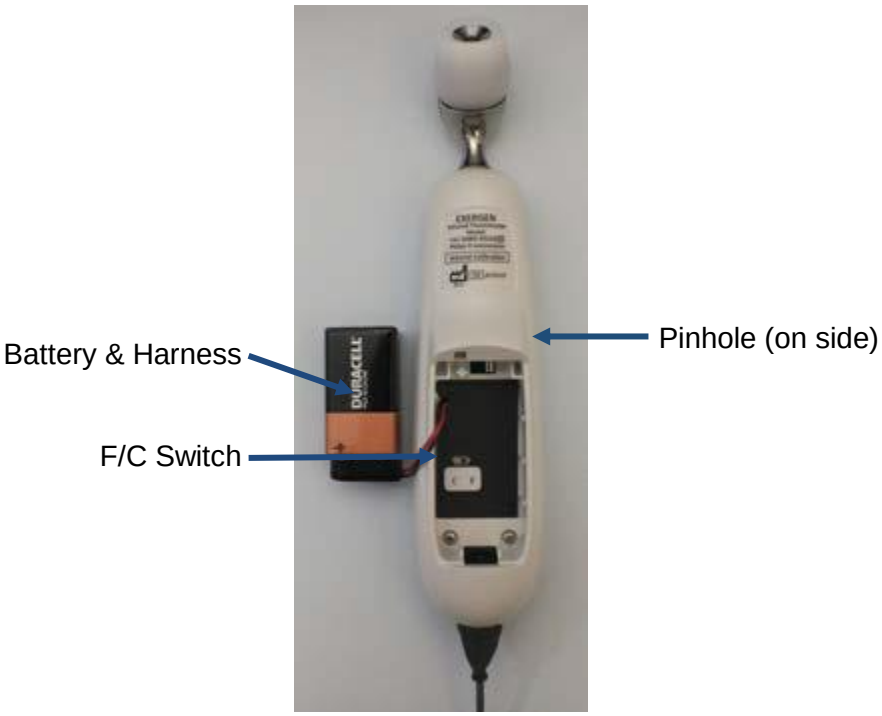


Figure 18: F/C Switch

REPLACING SCANNER CABLE (EXERGEN MODEL TAT-5000S-RS232)

REPLACING CABLE TO MONITOR

Follow this procedure to change the Exergen Temp scanner cable (Zoe Medical PN 01-02-0849) connected to the monitor (refer to Figure 19 (a) & (b) below):

1) Turn monitor OFF and remove the scanner from its cradle.
2) Using a #1 Phillips screwdriver remove the screw retaining the access door on the Temp module (a)
3) Disconnect the cable from the monitor by gently pushing the connecter release tab towards the cable and pulling the connector out of the socket (b)
4) Remove the cable from the access door strain-relief pins (c).
5) Route new cable through access door strain-relief pins (c).
6) Connect the cable connector into the socket (b) - proper insertion should result in a slight click. Gently pull on the cable to ensure proper insertion of connector into the socket.
7) Align the fingers on the access door with the slots in the access door recess.
8) Make sure the cable exits between the 2 semi-circle cutouts on the access door and access door recess.
9) Gentle push access door into access door recess.
10) Using a #1 Phillips screwdriver tighten the screw retaining the access door on the Temp module (a).
11) Turn monitor On and perform a Temp measurement as outlined in TAKING A EXERGEN TEMPERATURE on page 24.

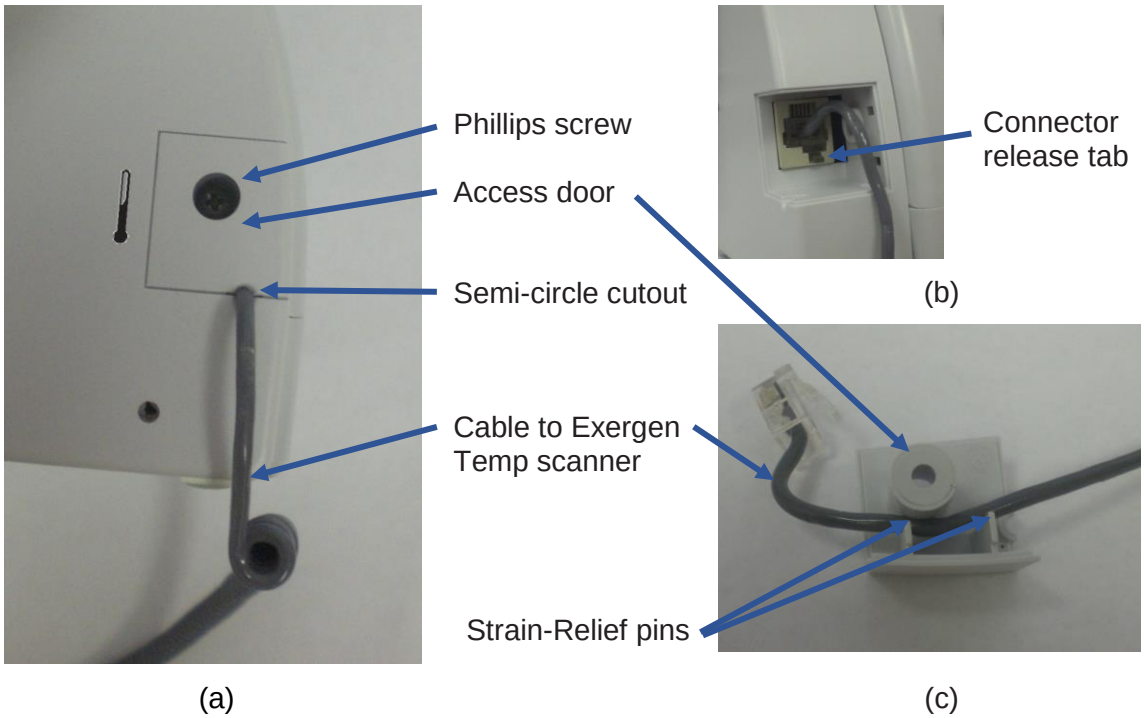


Figure 19: Replacing scanner cable attached to the monitor

REPLACING CABLE TO SCANNER (EXERGEN MODEL TAT-5000S-RS232)

Follow this procedure to change the cable (Zoe Medical PN 01-02-0849) connected to the Exergen scanner (Refer to Figure 18 below)

5) Turn monitor Off and remove the scanner from its cradle.
6) Insert the end of a bent paper clip into the pinhole on the side to release and remove the cover.
7) Remove the battery from the compartment.
8) Locate the cable release tab, and with the tip of a screwdriver in the small round depression in the tab, push the tab down.
9) Pull the cable out of the end of the scanner
10) Replace with new cable - Note the orientation of slots on plug and notch on the top of the opening at the bottom of the scanner
11) Push the new cable in until it clicks.
12) Gently pull on the cable to ensure proper insertion of connector into the socket.
13) Put the battery back into the compartment and replace the cover.
14) Turn monitor On and perform a Temp measurement as outlined in TAKING A EXERGEN TEMPERATURE on page 24.

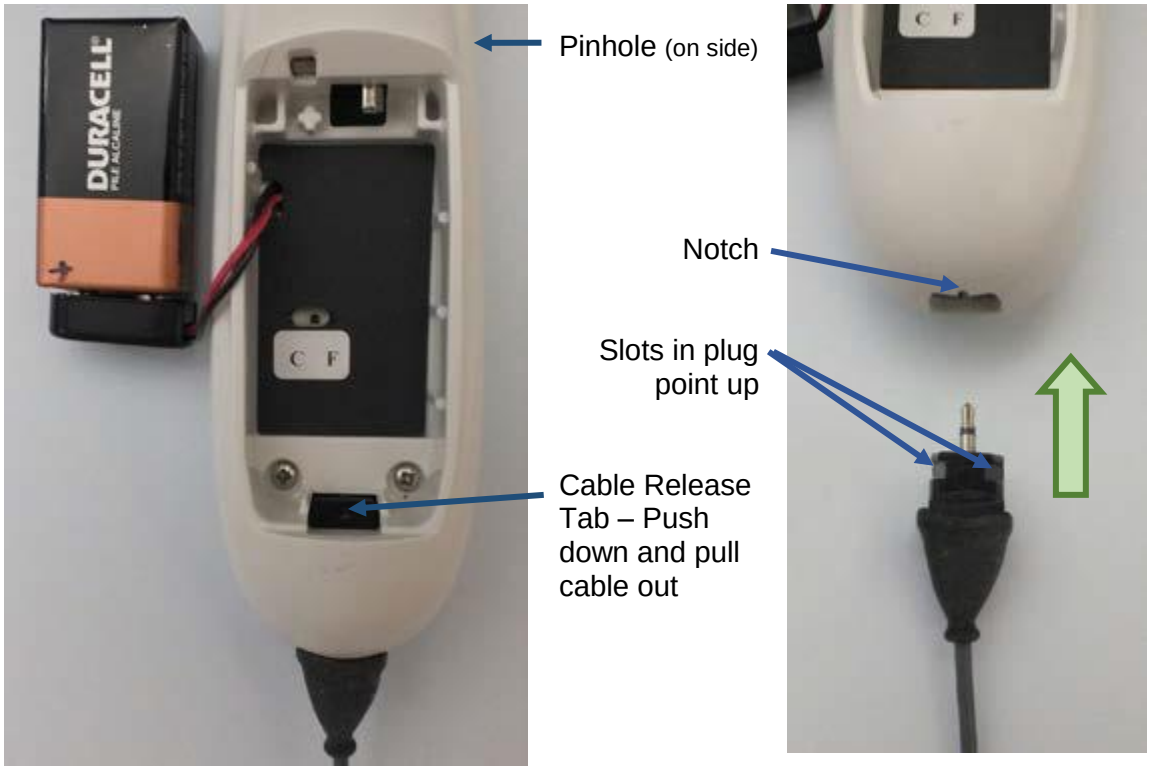


Figure 20: Replacing scanner cable connected to Exergen Temp scanner

6. CLEANING

Warning: Do not, under any circumstances, perform any testing or maintenance on the monitor while the monitor is being used to monitor a patient. The monitor must be turned "OFF". Unplug the monitor from the AC power source and remove the internal battery.

Caution: Do not open the monitor to clean or repair it. Contact Zoe Medical for service needs. Refer to page 3 for email and phone number information.

Caution: Disconnect all accessories from the monitor before cleaning. Do not immerse any part of the electrical connector of the cable or accessories in the cleaning or disinfection solution at any time. Do not use an abrasive cloth or cleaner on the accessories.

HANDLING

The Exergen Temp scanner is designed and built to industrial durability standards in order to provide long and trouble-free service. However, it is also a high precision optical instrument, and should be accorded the same degree of care in handling as you would provide other precision optical instruments, such as cameras or otoscopes.

CLEANING CASE

The Exergen Temp scanner case can be wiped down with a lint-free cloth, moistened with warm water (40 °C/104 °F maximum) and soap, a diluted non-caustic detergent, or alcohol-based cleaning agent, followed by drying with a clean lint-free cloth. Do not use strong solvents such as acetone. Avoid pouring any liquid on the thermometer while cleaning.

CLEANING SENSOR LENS

With normal use, the only maintenance required is to keep the lens on the end of the probe clean. It is made of special mirror like, coated silicon infrared-transmitting material. However, dirt, greasy films or moisture on the lens will interfere with the passage of infrared heat and affect the accuracy of the instrument. Regularly clean the lens with a cotton swab dipped in alcohol in accordance with the instruction label on the instrument (Refer to Figure 21). Use only light force for cleaning, to avoid damaging the lens. Water can be used to remove any residual film left by the alcohol. Do not use bleach or other cleaning solutions on the sensor lens.

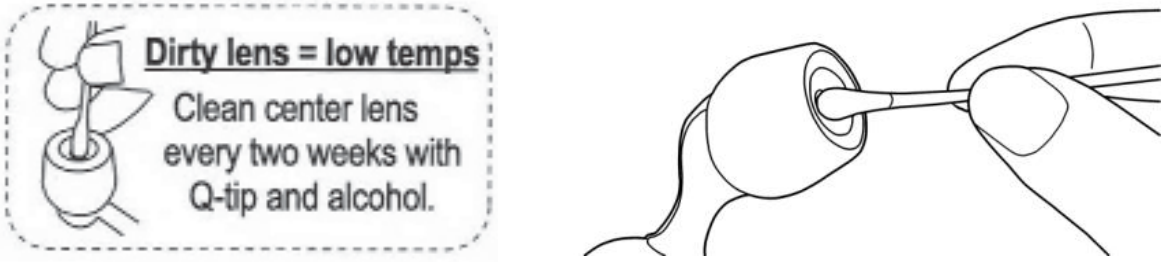


Figure 21: Cleaning Exergen Sensor Lens

DISINFECTION

Clean the Exergen Temp scanner before disinfecting. Recommended disinfecting agents are rubbing alcohol, Virex®[1], and dilute bleach solutions (1:10 to 1:100).

STERILIZATION

Sterilization is not recommended for cabled versions of the Exergen Temp scanner.

Caution: Do not submerse the Exergen Temp scanner in any cleaning solution.

1 Virex® is a Register Trademark of JohnsonDiversey, Inc.

7. MAINTENANCE

Refer to the 740 SELECT Field Service Manual, Zoe Medical PN 21-22-0331, for Temperature check functionality procedure.

SCANNER CALIBRATION

Factory calibration data is installed via a computer which communicates with the Exergen temp scanner's microprocessor. The instrument automatically self-calibrates each time it is turned on using this data, and will never require recalibration.

Warning: If readings are not correct, the instrument should be returned for repair.

Contact Zoe Medical Customer Service Department or your local distributor for more information. Refer to page 3 for email and phone number information.

REPLACING THE SCANNER'S BATTERY

When the Exergen temp scanner battery fails to hold a charge it will need to be replaced OR if the Exergen temp scanner will not be used regularly, remove the battery to prevent possible damage due to chemical leakage.

Follow this procedure to remove/replace the battery:

1) Insert a pointed object (e.g., the end of straightened paperclip) into the hole on the right rear of the temp scanner (looking at the back of the temp scanner). Refer to Figure 13 on page 23.
2) Pushing in and release the plastic battery compartment door.
3) Remove the plastic battery compartment door from the temp scanner.
4) Remove the 9V battery from the battery compartment of the temp scanner.
5) Disconnect the battery from the battery harness.

If the battery leaks, remove it carefully.

Caution: Do not allow bare skin to touch leaking fluids.

Properly dispose of used batteries.

Caution: Do not wrap them in metal or aluminum foil. Wrap them in paper before disposing of them, batteries may explode if overheated.

6) Connect a new 9V battery to the battery harness, noting the proper polarity of the 9V battery pins.
7) Install a new 9V battery into the temp scanner battery compartment,
8) Position the battery compartment door over the battery compartment by aligning the tabs with the slots at the bottom of the battery compartment.
9) Gently push down on the compartment door until the door is fully seated into the temp scanner's recess. A click should be heard when the latch is engaged.

Note: Use only high quality alkaline batteries in the Exergen temp scanner.

8. ACCESSORIES

Contact our Customer Service Department or go to our website for the latest product information. Refer to page 3 for email, website and phone number information.

EXERGEN TEMP

Catalog No.	Description	Reference #
01-02-1008	TAT-5000S-RS232, Arterial, Deg C 	124257
01-02-0849	TAT-5000S-RS232 to 740 SELECT monitor Interface cable 	124204
278-0115	TAT-5000S-USB, Arterial, Deg C 	124236
01-02-0824	TAT-5000S-RS232 and TAT-5000S-USB Resposable Probe Caps, latex free Box of 1000 - 20 sleeves of 50 each  	134209
01-02-0825	TAT-5000S-RS232 and TAT-5000S-USB Sheaths, Latex free, Complete covering for cross contamination protection Box of 250  	129463

9. SPECIFICATIONS

EXERGEN TEMP SCANNER (ALL MODELS)

DEVICE MARKINGS

	Caution
	Consult Instructions For Use
	Date of Manufacture - The four digits indicate the year of manufacture
	Patient connections are Type BF
	Indicates this monitor is subject to the Waste Electrical and Electronic Equipment Directive in the European Union
	UL Classification Mark

CHARACTERISTIC	SPECIFICATION
Clinical Accuracy: Clinical Performance (versus Oral Thermometry), per ISO 80601-2-56: Clinical Performance (versus Rectal Thermometry), per ISO 80601-2-56:	± 0.2°F or 0.1°C per ASTM E1112 • Clinical Bias: 0.52 °C • Limits of Agreement: 1.24 • Clinical Repeatability: 0.13 • Clinical Bias: 0.02 - 0.07 °C • Limits of Agreement: 0.87 - 1.15 • Clinical Repeatability: 0.13
Display value:	Temperature
Range:	61°F to 110°F (16°C to 43°C)
Arterial heat balance range for body temperature*:	94°F to 110°F (34.5°C to 43°C)
Operating Environment:	60°F to 104°F (16°C to 40°C)
Storage Environment	-4°F to 122°F (-20°C to 50°C)
Resolution:	0.1°F or °C
Response time	~ 0.04 seconds
Time displayed on scanner	30 Seconds
Battery type and life	9-volt alkaline battery, providing 15,000 readings**
Size	2.0" x 8" x 1.25" (5.0 cm x 20.0 cm x 3.0 cm)
Weight	0.7 lb (318 g)
EMI and RFI Protection	Stainless steel enclosure on upper part inside of casing
Display type and size	Large, bright red LED's
Materials:	• Industrial duty impact resistant casing • Chemically resistant casing and lens • Hermetically sealed sensing system • Stainless steel probe

* Automatically applied when temperature is within normal body temperature range, otherwise reads surface temperature.

** Approximate number of readings when scanning for 5 seconds and reading the temperature display for 3 seconds before turning off the thermometer.

Warning: The monitor may not meet performance specifications if stored or used outside temperature and humidity ranges. When moving the monitor from a storage location, wait at least one-hour or more prior to use to allow the monitor to adjust to room temperature.

PARAMETER ALARMS

Parameter	Units	Adult			Pediatric			Neonatal		
		Alarms On Default	Limit Default	Limit Range	Alarms On Default	Limit Default	Limit Range	Alarms On Default	Limit Default	Limit Range
Temp upper	°C	No	39.0	15.1 - 45.0	No	39.0	15.1 - 45.0	No	39.0	15.1 - 45.0
Temp upper	°F	No	102.0	59.1 - 113.0	No	102.0	59.1 - 113.0	No	102.0	59.1 - 113.0
Temp lower	°C	No	36.0	15.0 - 44.9	No	36.0	15.0 - 44.9	No	36.0	15.0 - 44.9
Temp lower	°F	No	97.0	59.0 - 112.9	No	97.0	59.0 - 112.9	No	97.0	59.0 - 112.9

Note: Lower Alarm Limit cannot be set above the associated Upper Alarm Limit.

Note: Upper Alarm Limit cannot be set lower than the associated Lower Alarm Limit.

NOTES: