# Reichert 7CR

## Auto Tonometer + Corneal Response Technology™

## User's Guide


AMETEK®
ULTRA PRECISION TECHNOLOGIES

Reichert®
TECHNOLOGIES

**Caution: Federal law restricts this device to sale by or on the order of a licensed physician. Rx Only.**

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# Warnings & Cautions

Reichert Technologies is not responsible for the safety and reliability of this instrument when:

- Assembly, disassembly, repair, or modification is made by unauthorized dealers or persons.
- Instrument is not used in accordance with this User's Guide.

⚠ **WARNING: AN INSTRUCTION THAT DRAWS ATTENTION TO RISK OF INJURY OR DEATH.**

**WARNING**: UNITED STATES FEDERAL LAW AND EUROPEAN REGULATIONS REQUIRE THAT THIS DEVICE BE PURCHASED ONLY BY A PHYSICIAN OR A PERSON ACTING ON BEHALF OF A PHYSICIAN.

**WARNING**: THIS INSTRUMENT SHOULD BE USED IN STRICT ACCORDANCE WITH THE INSTRUCTIONS OUTLINED IN THIS USER'S GUIDE. THE SAFETY OF THE OPERATOR AND THE PERFORMANCE OF THE INSTRUMENT CANNOT BE GUARANTEED IF USED IN A MANNER NOT SPECIFIED BY REICHERT TECHNOLOGIES.

**WARNING**: DO NOT REPAIR OR SERVICE THIS INSTRUMENT WITHOUT AUTHORIZATION FROM THE MANUFACTURER. ANY REPAIR OR SERVICE TO THIS INSTRUMENT MUST BE PERFORMED BY EXPERIENCED PERSONNEL OR DEALERS WHO ARE TRAINED BY REICHERT SO THAT CORRECT OPERATION OF THIS INSTRUMENT IS MAINTAINED OR SERIOUS INJURY TO THE OPERATOR OR PATIENT MAY OCCUR.

**WARNING**: MODIFICATIONS TO THIS INSTRUMENT IS NOT ALLOWED. ANY MODIFICATION TO THIS UNIT MUST BE AUTHORIZED BY REICHERT SO THAT CORRECT OPERATION IS MAINTAINED OR SERIOUS INJURY TO THE OPERATOR OR PATIENT MAY OCCUR.

**WARNING**: IF THIS INSTRUMENT IS MODIFIED, APPROPRIATE INSPECTION AND TESTING MUST BE CONDUCTED TO ENSURE CONTINUED SAFE USE OF THIS INSTRUMENT.

**WARNING**: TO AVOID RISK OF ELECTRIC SHOCK, THIS EQUIPMENT MUST ONLY BE CONNECTED TO A SUPPLY MAINS WITH PROTECTIVE EARTH OR DAMAGE TO THE OCULAR RESPONSE ANALYZER AND/OR INJURY TO THE OPERATOR OR PATIENT MAY OCCUR.

**WARNING**: ENSURE THAT THE VOLTAGE APPLIED TO THE UNIT IS THE SAME AS THE VOLTAGE THAT IS INDICATED ON THE DATA PLATE OR DAMAGE TO THE INSTRUMENT AND/OR INJURY TO THE OPERATOR OR PATIENT MAY OCCUR.

**WARNING:** THIS INSTRUMENT MUST BE PLUGGED INTO AN OUTLET WITH AN EARTH GROUND. DO NOT REMOVE OR DEFEAT THE EARTH GROUND CONNECTION ON POWER INPUT CONNECTOR OR THE UNIT'S POWER CORD OF THIS INSTRUMENT OR DAMAGE TO IT AND/OR INJURY TO THE OPERATOR OR PATIENT MAY OCCUR.

**WARNING**: THE EQUIPMENT OR SYSTEM SHOULD NOT BE USED ADJACENT TO OR STACKED WITH OTHER EQUIPMENT AND THAT IF ADJACENT OR STACKED USE IS NECESSARY, THE EQUIPMENT OR SYSTEM SHOULD BE OBSERVED TO VERIFY NORMAL OPERATION IN THE CONFIGURATION IN WHICH IT WILL BE USED

**WARNING**: THIS INSTRUMENT IS NOT SUITABLE FOR USE IN THE PRESENCE OF FLAMMABLE ANESTHETIC MIXTURES, SUCH AS OXYGEN OR NITROUS OXIDE.

**WARNING**: DO NOT PLACE FINGERS INTO THE OPENING SURROUNDING THE NOSEPIECE.

# Warnings & Cautions (continued)

**CAUTION: AN INSTRUCTION THAT DRAWS ATTENTION TO THE RISK OF DAMAGE TO THE PRODUCT.**

**CAUTION:** THE INTERNAL CIRCUITRY OF THE INSTRUMENT CONTAINS ELECTROSTATIC DISCHARGE SENSITIVE DEVICES (ESDS) THAT MAY BE SENSITIVE TO STATIC CHARGES PRODUCED BY THE HUMAN BODY. DO NOT REMOVE THE COVERS WITHOUT TAKING PROPER PRECAUTIONS.

**CAUTION:** DO NOT USE SOLVENTS OR STRONG CLEANING SOLUTIONS ON ANY PART OF THIS INSTRUMENT AS DAMAGE TO THE UNIT MAY OCCUR. SEE MAINTENANCE SECTION FOR DETAILED CLEANING INSTRUCTION.

**CAUTION**: USE OF AMMONIA BASED CLEANERS ON THE LIQUID CRYSTAL DISPLAY (LCD) MAY CAUSE DAMAGE TO DISPLAY. SEE MAINTENANCE SECTION FOR DETAILED CLEANING INSTRUCTION.

**CAUTION:** MEDICAL ELECTRONIC EQUIPMENT NEEDS SPECIAL PRECAUTIONS REGARDING EMC AND NEEDS TO BE INSTALLED AND PUT INTO SERVICE ACCORDING TO THE EMC INFORMATION PROVIDED IN THE ACCOMPANYING DOCUMENTS.

**CAUTION:** PORTABLE AND MOBILE RF COMMUNICATIONS EQUIPMENT CAN AFFECT MEDICAL ELECTRICAL EQUIPMENT.

**CAUTION:** THIS INSTRUMENT IS NOT TO BE USED NEAR HIGH-FREQUENCY EMITTING SURGICAL EQUIPMENT.

**CAUTION:** THIS INSTRUMENT IS NOT TO BE USED NEAR HIGH-FREQUENCY EMITTING SURGICAL EQUIPMENT.

**CAUTION:** THIS INSTRUMENT IS NOT INTENDED TO BE CONNECTED TO EQUIPMENT OUTSIDE THE CONTROL OF REICHERT.

# Symbol Information

## Symbol Information

The following symbols appear on the instrument:

Caution symbol indicating important operating and maintenance instructions that are included in this User's Guide.

Type B Applied Part

Alternating Current Power.

Protective Earth Connection.

ON / OFF.


Date of Manufacture.

REF

Catalog Number.

S/N

Serial Number.

Waste of Electrical and Electronic Equipment.


Compliance to Medical Device Directive 93/42/EEC.

Authorized to mark given by Intertek ETL Semko for conformance with electrical standards.

Accompanying Documents must be consulted.


Authorized Representative in European Community

Fragile Contents in Shipping Container - handle with care

Keep Dry - Package shll be kept away from rain.

This Way Up - Indicates correct upright position of package

# Introduction

Congratulations on your purchase of the Reichert 7CR Auto Tonometer + Corneal Response Technology™.

The Reichert 7CR is an auto-aligning, non-contact tonometer used to measure the intraocular pressure of the eye by delivering a very soft air puff or puffs to the eye. The patented Bi-directional applanation process employed in the Reichert 7CR enables the device to quantify the biomechanical properties of the cornea and minimize the impact of these on the IOP measurement. This new IOP measurement, referred to as Corneal Compensated IOP (IOPcc) has been shown to be less affected by corneal properties than other methods of tonometry. Refer to the *Instructions for Use* section for further details on IOPcc.

This User's Guide is designed as a training and reference manual for operation, maintenance, and troubleshooting. We recommend that you read it carefully prior to use and follow the instructions in the guide to ensure optimum performance of your new instrument. Properly trained eyecare professionals such as ophthalmologists, optometrists, opticians and eye care technicians should operate this instrument.

Please retain this guide for future reference and to share with other users. Additional copies can be obtained from your authorized Reichert, Inc. dealer or contact our Customer Service department directly at:

Tel: 716-686-4500
Fax: 716-686-4555
E-mail: info@reichert.com.

## Indications for use

The 7CR is intended to measure the intraocular pressure of the eye, taking into consideration the biomechanical response of the cornea.

## Contraindications

Use of the Reichert 7CR is contraindicated in instances of:

- Following keratoplasty
- Following penetrating trauma.

**FEDERAL LAW RESTRICTS THIS DEVICE TO SALE BY OR ON THE ORDER OF A PHYSICIAN.**

# Instrument Setup

Great care has been taken to deliver your new Reichert 7CR to you safely. The container and packaging was specially designed to transport this unit. Please retain the packaging if future transportation is required.


Shipping Container

Inner Box

Opened Inner Box

## Unpacking Instructions

Please remove the packaging material from the instrument in the following manner (Refer to images on left).

The instrument is packaged in a shipping container to protect the instrument from damage during shipment. **Please read the User's Guide before operating the unit.**

1. Remove the accessories box from the shipping container.

   Accessories box contains:
   - Power cord, 10 ft. (3.05 m)
     (Note: power cord not to exceed 10 ft.)
   - Dust Cover
   - Spare printer paper (2 rolls)
   - Quick Reference Card
   - User's Guide

2. Remove the Top Foam (4 corners) from the shipping container.
3. Locate the handles on the sides of the inner box and remove the inner box.
4. Lay the inner box on its side and remove tape.
5. Remove the foam top and bottom inserts from the inner box. Lift the Reichert 7CR out of the inner box.
6. Take the Reichert 7CR out of the plastic bag and set the unit on a secure table.
7. Place the packing material in a safe place so that if transportation is required in the future, they will be available.

# Instrument Setup (continued)

## Application of Input Power

**WARNING:** CARE MUST BE TAKEN TO ARRANGE THE CABLES FOR THE ACCESSORIES SUCH THAT THEY DO NOT PRESENT A TRIPPING HAZARD TO THE EXAMINER OR A DANGER TO THE PATIENT.

**WARNING**: POSITION THIS INSTRUMENT SO THAT IT IS NOT DIFFICULT TO OPERATE THE DISCONNECTION DEV ICE (PLUG).

1. After the unit is in its secure location, apply the correct input voltage to the instrument using the Power Cord from the Accessory Tray.
2. Press down on the "|" located on the ON/OFF Switch. The power inlet is located on the underside of the unit (Refer to page 10, item 8, for its location).
3. Read the User's Guide and the Quick Reference Card before operating this instrument.

**WARNING:** DO NOT REMOVE THE OUTSIDE COVERS OF THE UNIT OR ATTEMPT TO REPAIR ANY INTERNAL PARTS. REPAIR AND SERVICE OF THE UNIT MUST BE PERFORMED BY EXPERIENCED PERSONNEL OR DEALERS THAT ARE TRAINED BY REICHERT.

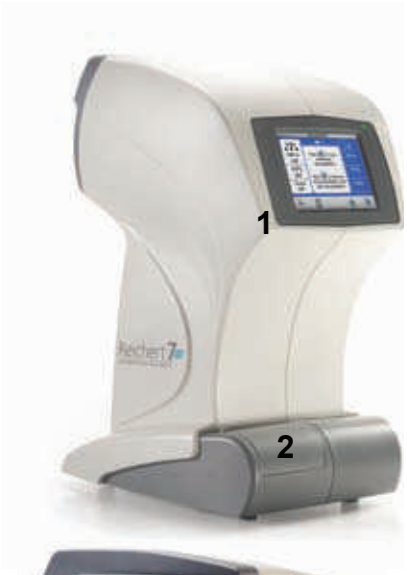
**CAUTION:** ENSURE THAT THE VOLTAGE APPLIED TO THE UNIT IS THE SAME AS THE VOLTAGE THAT IS INDICATED ON THE DATA PLATE NEXT TO THE INPUT CORD RECEPTACLE OR DAMAGE TO THE UNIT MAY OCCUR.

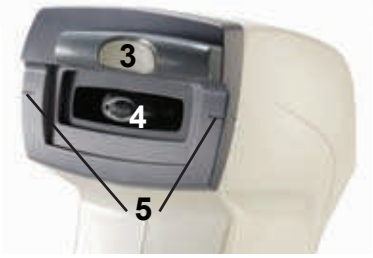
**CAUTION:** FOR CONTINUED PROTECTION AGAINST THE RISK OF FIRE, ANY REPLACEMENT OF DAMAGED FUSES MUST BE IN ACCORDANCE WITH THE RATING AS INDICATED IN THE SPECIFICATIONS SECTION OF THIS MANUAL.

## Disconnection of Input Power

1. At any time, the power switch can be set to OFF. The unit does not have a power down sequence. To terminate operation of this instrument, press the ON / OFF switch to the OFF position (O).
2. If this instrument is intended to be OFF for an extended period of time, it can be disconnected from power by detaching the power cord from the its receptacle.

# Instrument Setup (continued)







## Parts Identification

1. **Operator Display:** Displays measurement data.

2. **Printer Door:** Door (push button to open) to access printer paper.

3. **Forehead Rest:** Alignment mechanism that moves right/left for correct patient positioning.

4. **Nosepiece Objective:** Air tube where “air puff” is emitted.

5. **Canthus Alignment Marks (right and left side):** Alignment mark that indicates the vertical position of the center of the patient’s eye.

6. **ON/OFF Switch:** Switch that controls input power to the unit. “O” indicates OFF, and “|” indicates “ON”.

7. **USB Port:** Communication port that transfers printer data.

   Note: USB drivers are available on the web page for the Reichert 7CR at: http://www.reichert.com

8. **Main Power Connector and Fuse Holder:** Connection point for input power and the fuses. Press the top tab and bottom tab together on the fuse panel to remove the fuse holder and fuses. Located on underside of unit.

9. **Printer:** Thermal printer supplied with the unit.

## Accessories:

- Chinrest (P/N 16049)
- Printer Paper (P/N 12430-887)
- Dust Cover (P/N 16050-081)
- Quick Reference Card (P/N 16060-104)
- USB Cable - 6 ft. (1.8m) (P/N 15208-431)
- Power Cord (RCBL10040 - 110V) or (RCBL10041 - 230)

# Instrument Setup (continued)

## Icon Definition

The Reichert 7CR incorporates a user-friendly icon/menu-based operating system that will increase the speed of measurements, training and use. Below are the Icons that are used during the operation of this instrument.

| Icon | Icon Description |
|---|---|
|  | MENU — Accesses secondary level menus such as setup and help. |
|  | MEASURE — Initiates a single-puff measurement process. |
|  | TRIPLE MEASURE — Initiates a triple-puff measurement process. |
|  | DEMO — Allows patient to feel a soft demonstration air puff. |
|  | CLEAR DATA — Clears both right and left data on the Operator Display and in memory. |
|  | PRINT — Sends the data to the printer. |
|  | SERVICE — Displays service information. |
|  | CANCEL — Cancels measurement process. |
|  | PROCEED — Proceed with measurement process. |
|  | SELECT — Confirms entry. |
|  | BACK — Returns to preceding screen. |
|  | RIGHT ARROW — Used in the setup menus to move right horizontally. |
|  | LEFT ARROW — Used in the setup menus to move left horizontally. |
|  | DOWN ARROW — Used in the setup menus to move down vertically. |

## Default Settings

The Reichert 7CR has default settings that are set at the factory. A summary of these settings is given on the next page. A detailed definition/explanation of each setting is given on pages 13-17.

The following steps provide the details on how to customize the default settings.

**How to Customize:**

1. Touch the screen on the MENU icon.
2. Touch the screen on the UP/DOWN arrows icon to choose the appropriate setup category (e.g., Printout Setup).
3. Touch the screen on the SELECT icon to display the parameters and settings of the setup categories.
4. Touch the screen on the UP/DOWN arrows icon to move the cursor box to the desired parameter.
5. Touch the screen on the SELECT icon to activate the highlighted parameter.
6. Touch the screen on the appropriate RIGHT/LEFT arrows icon to move the cursor box to the desired setting for the parameter.
7. Touch the screen on the SELECT icon to activate the highlighted setting.
8. Touch the screen on the BACK icon to step back through the previous menus until the Main Menu is shown.

**CAUTION:** DO NOT USE A POINTED OBJECT TO TOUCH THE SCREEN OR DAMAGE TO THE DISPLAY MAY RESULT.

## Default Settings (continued)

This instrument is sent from the factory with measurement, printer, communication, and miscellaneous parameters set to default settings. These settings can be changed to suit the needs of the individual operator/clinician. A summary of these settings is given below with the default selections shown in bold type. To customize these settings, follow the steps given on page 12, Instrument Setup, Default Settings.

**Customized Options**
This instrument has the following default settings:

Tonometer Setup: (page 14)
Pressure: kPa **mmHg**

Printout Setup: (page 15)
- Date Format: **MDY,** DMY, YMD
- Time Format: **AM/PM,** 24 HR
- Date: 12/18/2007
- Time: 05:00PM
- Printer: **On,** Off
- Practice: **Reichert**

Communication Port Setup: (page 16)
- Baud: 1200, 2400, 4800, 9600, **19200**
- Parity: **None,** Even, Odd
- Data Bits: 7, **8**
- Stop Bits: **1,** 1.5, 2

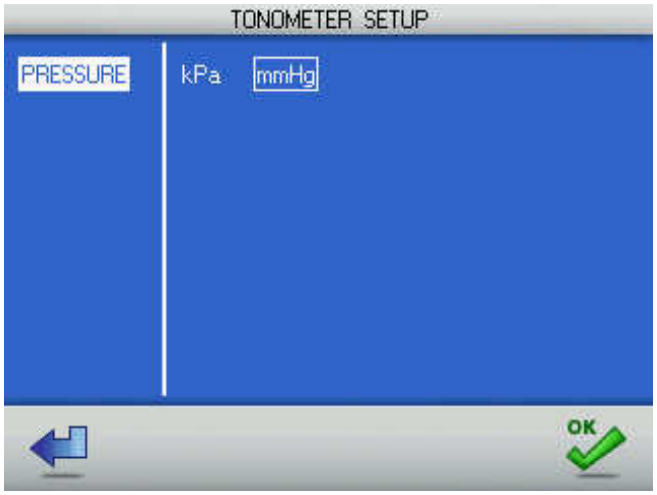
General Setup: (page 17)

Language: **Eng,** Fra, Deu, Esp, Por, Ita
- Tone: **On,** Off
- Sleep: 5, **10,** 20, 90
- Contrast: - | | | | | | | | +

**Note:** Default settings are shown in **Bold** type.

# Instrument Setup (continued)

## Tonometer Settings


The following options are available in the Tonometer Setup menu:

| Parameters | Settings |
|---|---|
| PRESSURE | Choose either kilo Pascals (kPa) or millimeters of mercury (mmHg). |

# Instrument Setup (continued)

## Printout Settings



The following options are available in the Printout Setup menu:

| Parameters | Settings |
|---|---|
| DATE FMT | Choose the date format that will be shown on the printer paper:<br><br>D=Day, M=Month, Y=Year. |
| TIME FMT | Choose the time format: AM/PM or 24 HR. |
| DATE | Change the current date. Use the PLUS (+) or MINUS (-) icons to increase or decrease the numbers, then touch the SELECT icon. |
| TIME | Change the current time. Use the PLUS (+) or MINUS (-) icons to increase or decrease the numbers, then touch the SELECT icon. |
| PRINTER | Option that sets the printer to print (ON) or not to print (OFF) when the print icon is touched. |
| PRACTICE | Up to 30 characters (letters and numbers) can be printed at the bottom of the printer paper. To change the characters, use the PLUS and MINUS icons to scroll through the alphabet. Once you have found the letter you require, touch the RIGHT or LEFT icon to move horizontally to the next letter. To exit, touch the SELECT icon, then the RETURN icon. |

# Instrument Setup (continued)

## Communications Settings

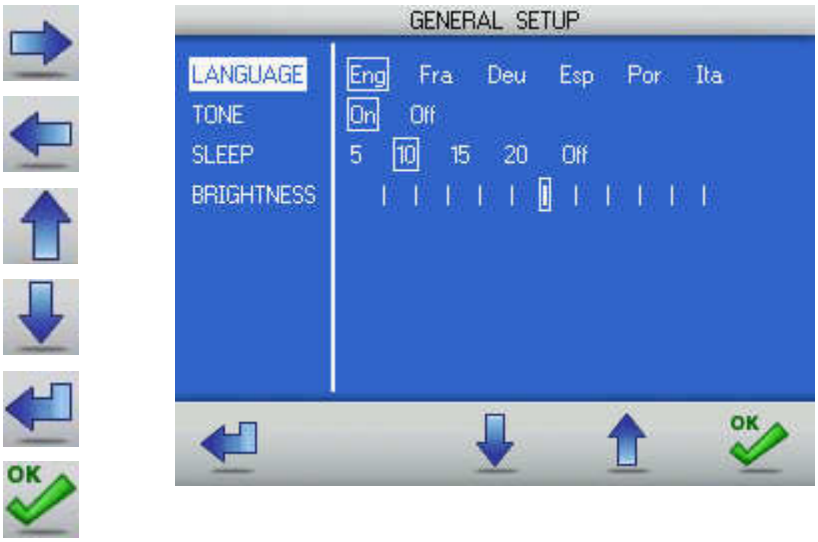

The Reichert 7CR can transfer data to an external device, such as a computer, through the USB port.

The following options are available in the Communications Setup menu:

| Parameters | Settings |
|---|---|
| BAUD | Serial transmission data rate, transfers in bits per second (bps). |
| PARITY | Bits added to data transmission used to detect transmission errors. None, Even, or Odd are the available options. |
| DATA BITS | Number of bits that make up data transmission word. Usually 7 or 8 bits in length. |
| STOP BITS | Number of bits added to the end of the data transmission word to signal the end of transmission. Usually 1, 1.5, or 2 bits in length. |
| PRINTER | Option that sets the printer to print (ON) or not to print (OFF) when the print button is pressed. When the printer is set to OFF, the patient data is sent only to the USB port. When the printer is set to ON, the patient data is sent to the printer and the USB port. |

# Instrument Setup (continued)

## General Settings




The following options are available in the General Setup menu:

| Parameters | Settings |
|---|---|
| LANGUAGE | Sets the language that is used on the Operator Display. |
| TONE | The audible tone indicator (“beep”) can be set to be silent (OFF) or audible (ON). |
| SLEEP | Choose the duration of time (5, 10, 20 or 90 minutes) that the instrument is inactive before it initiates the “sleep” mode (the Operator Display goes blank when the “sleep” mode is active). To illuminate (“wake”) the Operator Display after the “Sleep” mode is active, press any Control Button. |
| BRIGHTNESS | Changing the position of the slide bar adjusts the contrast of the Operator Display. |

# Instructions For Use

## Definitions and Interpretation of the measurement values:

- IOPg - Goldmann-correlated IOP. IOPg agrees, on average, with the results obtained from an expertly executed, properly calibrated Goldmann Applanation Tonometer (GAT).
- IOPcc - Corneal Compensated IOP. IOPcc takes the biomechanical properties of the cornea into consideration providing an indication of intraocular pressure that is less influenced by properties such as corneal visco-elasticity and thickness.
- Score – The score is an indicator of measurement reliability on a scale of 1 to 10 (1 being lowest, 10 being highest). The higher the score, the more reliable the measurement data. If the score is below 3, the measurement will be flagged with an asterisk. It is recommended that you take an additional measurement.

**Note:** When IOPcc is higher than IOPg, this indicates that the IOP for this patient may be being understated using traditional methods of tonometry.

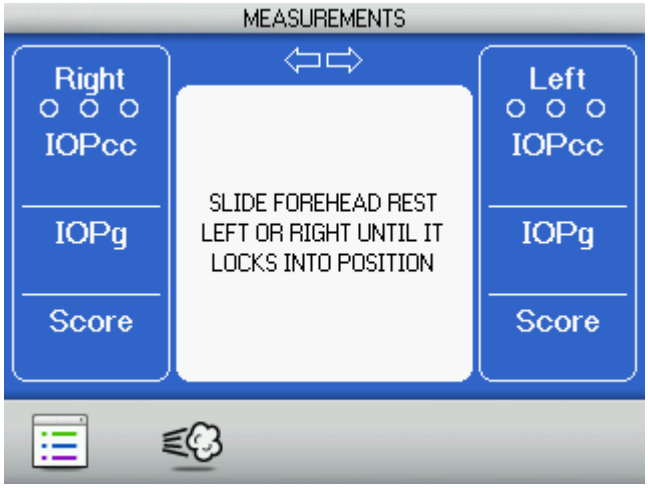
**Note:** When IOPcc is lower than IOPg, this indicates that the IOP for this patient may be being overstated when using traditional methods of tonometry.

## Alignment & Measurement

Once powered on, the Reichert 7CR will initially perform a system verification. After this is completed, the title screen will be displayed.

## Alignment & Measurement (continued)

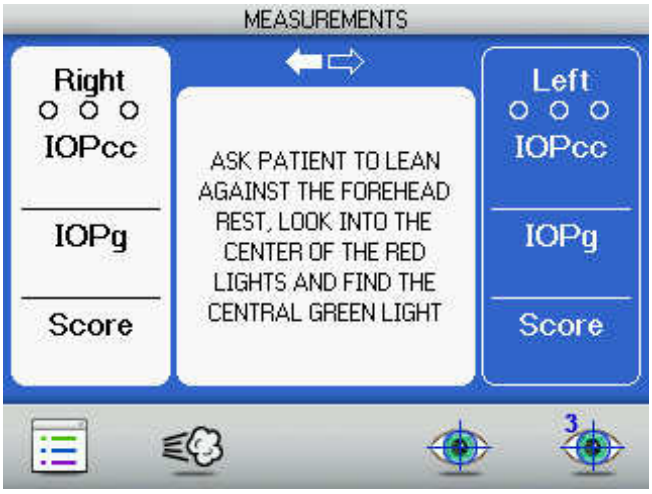
A message will be displayed to move the Forehead Rest fully to the left or right until it locks into position if it is not already in this position. From this screen operators may choose to enter the Menu, demonstrate the airpuff to the patient, or begin the measurement process.




DEMO PUFF:

Pressing the button under the DEMO icon initiates a sample air puff. This can be used to demonstrate the air puff to the patient.

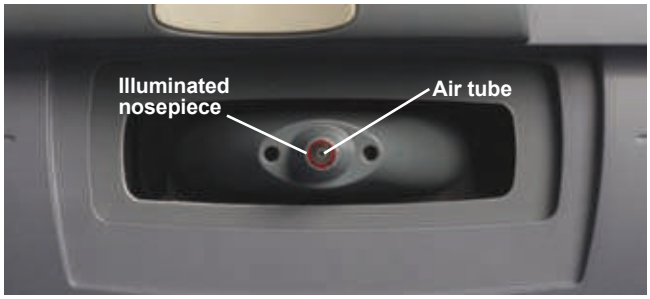
After each time the DEMO button is pressed and the air puff is delivered, an internal check of the Reichert 7CR's systems is conducted to ensure optimum performance of your instrument.




**Note:** The DEMO icon will not display if there are measurements displayed on the screen. Touch the DELETE icon to make the DEMO icon visible.

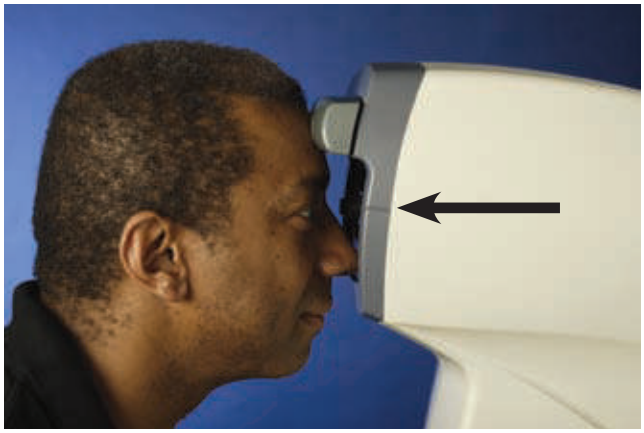
## Alignment & Measurement (continued)


The Reichert 7CR features a left/right sliding forehead rest that enables the instrument to automatically determine which eye is being measured. It must be positioned completely to one side or to the other in order to take a measurement. Position the forehead rest to the desired position before beginning the measurement process.



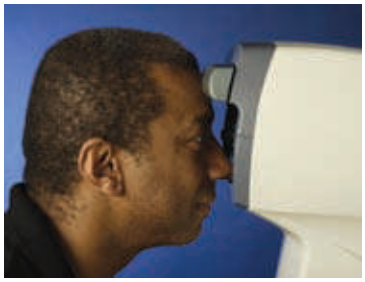

A properly-positioned patient will easily see the fixation cues. The fixation target is a green light, located inside the air tube, surrounded by a ring of red lights. In order to take a measurement, patients must be fixating on the green light. If a patient is unable to see the green light, the operator should ask if the patient can see any of the red lights. If any red lights can be seen, the automatic alignment system will bring the green fixation target into view.

## Alignment & Measurement (continued)



CORRECT PATIENT POSITIONING:
Set the height of the table so the canthus marks on the sides of the instrument are level with the patient's eyes.

Patients should lean forward slightly so that the center of their forehead rests in the middle of the rubber forehead pad. The patient's head should contact the headrest straight-on; perpendicular to the front of the instrument (not turned to the side). In addition, the patient's nose and chin should be inward, towards the front surface of the unit.



**Proper** patient alignment
(chin close to unit)

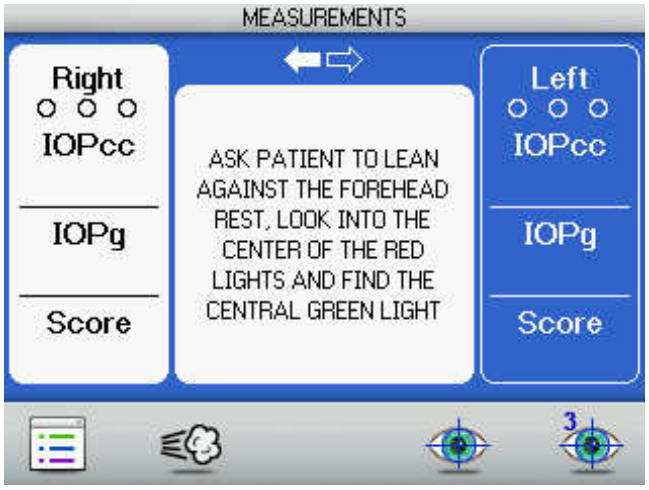
***Improper*** patient alignment
(chin moved away from unit)

Observe the photo on the right. Notice the distance between the patient's chin and the front of the instrument. The instrument is too low, causing the patient to rest his head in a downward-facing manner. In this instance, the patient may not be able to see the fixation target, and the alignment system may not be able to find the patient's eye.

## Alignment & Measurement (continued)

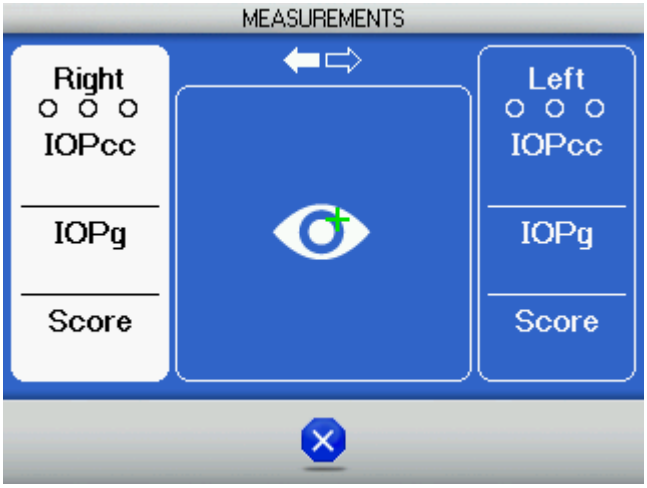
To take a measurement, simply touch one of the measurement icons.

- Touching the MEASURE icon (one puff) will initiate a measurement with one puff.
- Touching the TRIPLE MEASURE icon (three puffs) will initiate a measurement with three rapid puffs.


**Note:** To ensure fast and accurate results operators should instruct the patient to blink a few times and hold both eyes open immediately before measurement. Remind the patient to look directly at the green light and hold steady.

## Alignment & Measurement (continued)

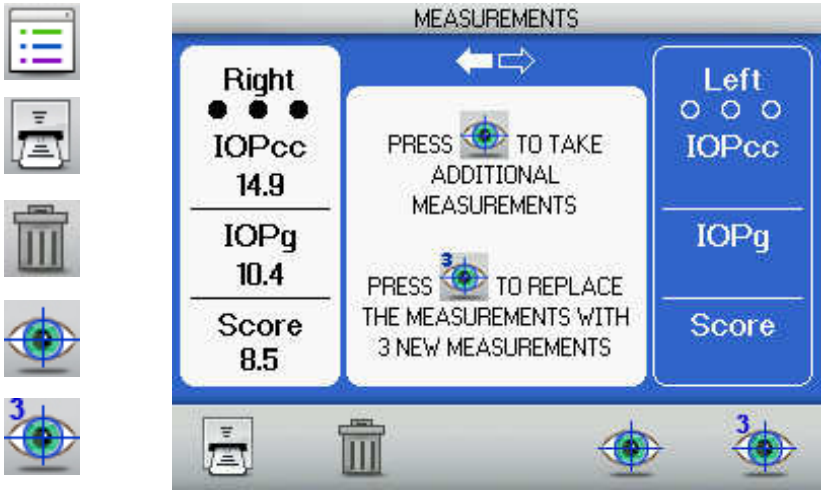



During the alignment and measurement process, the Operator Display will show the position of the airtube with respect to the center of the patient's cornea. As the positioning system aligns to the apex of the eye, the measuring icon will move to the middle of the screen and align over the center alignment mark (+). Once the positioning system is aligned the air "puff" or "puffs" are delivered to the eye and the IOP measurement is automatically displayed.

**Note:** If the instrument is unable to properly align to the patient's eye and take a measurement (e.g., it keeps aligning but never takes a reading), it may be necessary to ask the patient to:

- Remain still and try not to move or blink frequently
- Open his/her eyes wider
- Reposition his or her head per the instructions indicated above.

## Alignment & Measurement (continued)




### Measurement Count

The circles above the right and left eye measurement data indicate the number of measurements that have been made. A circle will become filled after each successive measurement.

**Note:** It is recommended that three measurements per eye are taken to ensure reliability of the results.

### Score

An advanced signal "scoring" process is employed in the 7CR to objectively determine the reliability of the measurement data. On a scale of 0 to 10, the higher the score, the more reliable the measurement data.

### Measurement Results

If a single measurement is taken on an eye, the IOPcc, IOPg, and Score for that measurement will be displayed. If multiple measurements are taken on an eye and the scores are within 1 unit of each other, average values are displayed. If the score of any measurement in a series of measurements is 1 unit higher than the previous measurements the results will be replaced with data based on the highest score.

## Alignment & Measurement (continued)

### Measuring the Next Eye

There are several options available at this point:

**(a)** The Forehead Rest may be slid to the opposite side to continue taking measurements on the other eye.

**(b)** All data may be cleared and additional measurements taken on the same eye (touch the CLEAR icon).

**(c)** The data can be printed by touching the PRINT icon.

**Note:** The instrument will print out the data from both eyes if the PRINT icon is touched after both eyes are measured.

**Note:** Measurement data should always be printed or cleared after a patient is completed. Leaving readings on the screen can result in "mixing" of data when the next patient is measured.

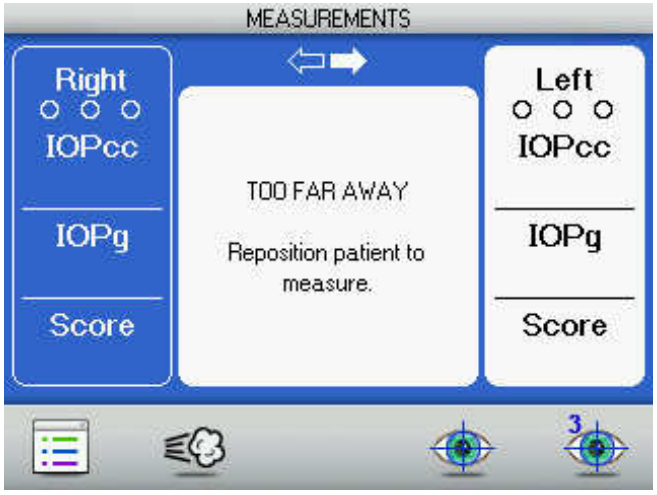
## Low Confidence Readings


Any measurement values identified as "Low Confidence" will be indicated in orange text with an asterisk after the measurement value. Take additional measurements to replace the low confidence values.

**Note:** It is possible that post refractive surgery eyes, eyes with corneal pathologies, and glaucomatous eyes will produce consistently low measurement scores. The IOP values based on the highest obtainable scores should be considered reliable.

## Positioning Error Messages

During the measurement process, the Reichert 7CR may detect a situation where the patient is not properly positioned. Various error messages may inform the operator that the patient is Too Far Away, Too Far Left, Too Far Right, Too High, Too Low, or Too Close. Should this occur, the instrument will back away from the patient's eye and display a message similar to the one shown below.




Should this situation arise, ask the patient to move away from the instrument, then reposition the patient and proceed with the next measurement.

## Printing Measurement Data

To print the measurement data, touch the PRINT icon.

**A sample printout is shown below.**

Name:_____

03/17/2010 02:27 PM

| | IOPcc | IOPg | Score |
|---|---|---|---|
| (R) | 23.2 | 21.5 | 8.5 |
| (L) | 22.8 | 21.5 | 8.0 |

Reichert

Sample Printout

If you decide not to make a printout, touch the CLEAR DATA icon. This will clear all data from the memory and the screen. The instrument is now ready for the next patient.

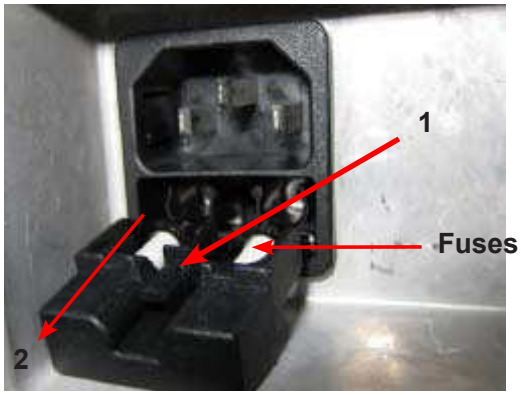
# Cleaning & Maintenance

## Fuses

**WARNING:** DISCONNECT POWER BEFORE ATTEMPTING TO REMOVE THE FUSES OR SERIOUS INJURY OR DEATH MAY OCCUR.

Replace the fuses in the Power Input Module with the fuses indicated in the Specifications section of this manual.

1. Remove input power to the instrument and press down on the tab in the middle of the Power Input Module to release the Fuse Holder.
   Refer to item 1.
2. Pull the fuse holder out of the input module. Refer to item 2.
3. Install new fuses that are indicated in the Specification section of this manual into the Fuse Holder.
4. Push the Fuse Holder into the Power Input Module until it snaps into place.



Fuse Location

## External Cleaning

Clean the external surfaces of this instrument using a clean, soft cloth moistened with a mild detergent solution (1 cc of liquid dish soap to one liter of clean, filtered water (filtered below 5 microns)).

## Forehead Rest Cleaning

For hygienic reasons, the Forehead Rest may be cleaned with a clean cloth moistened with a mild detergent solution (1 cc of liquid dish soap to one liter of clean, filtered water (filtered below 5 microns)).

**Note:** If the Forehead Rest pad must be sanitized, a sterile wipe may be used occasionally.

## Positioning Windows and Airtube Cleaning

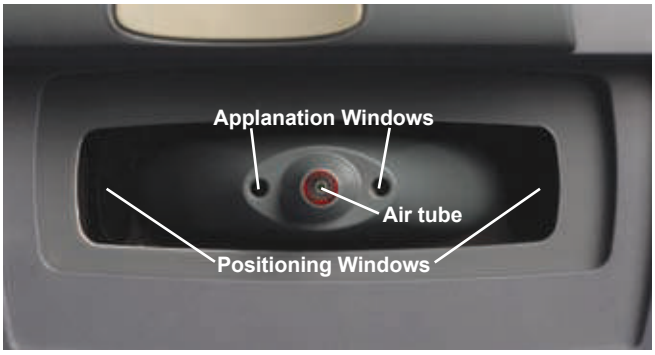
When the Positioning Windows or the Applanation Windows become occluded with contaminants, degradation of the positioning signal occurs. When signal degradation occurs, the system may not recognize or position at the center of the eye. Consequently, the instrument will not find the center of the eye or align off center, which may prevent the unit from taking a measurement or can cause asterisk readings.

**CAUTION:** DO NOT USE ALCOHOL, SOLVENTS OR STRONG CLEANING SOLUTIONS ON THE ALIGNMENT WINDOWS OR DAMAGE TO THE WINDOWS WILL OCCUR.

# Cleaning & Maintenance (continued)

## Positioning Windows Cleaning (continued)

1. Locate the Positioning Windows and the Applanation Windows and wipe the outside surfaces with a clean, long handle cotton-tip swab moistened with a lens cleaner that is safe for plastic lenses.
2. Remove any remaining dust or foreign particles using only clean, dry, compressed air at less than 90 psig (620 kPa).




Positioning Windows

⚠ **WARNING**: AFTER CLEANING THE INSIDE OF THE AIRTUBE, TOUCH THE DEMO ICON A FEW TIMES ON THE OPERATOR'S SCREEN SO THAT ANY CONTAMINANTS ARE SAFELY REMOVED FROM INSIDE THE AIRTUBE.

3. Using a Pipe Cleaner, slide it in and out of the Airtube a few times to remove any contaminants inside the Airtube.
4. After cleaning the inside of the Airtube, reset power to the unit and then press the button below the DEMO icon (located on the operator's screen) several times to ensure that any contaminants dislodged within the Airtube by the cleaning process are expelled from the Airtube before performing a measurement.

Pipe Cleaners

## Operator Display Cleaning

Use a clean, soft cloth with neutral detergent or ethanol to clean the operator display. Do not use any chemical solvent, acidic, or alkali solution.

## Printer Paper

To change the printer paper, remove the printer paper door to expose the printer paper compartment. Remove the cardboard roll and place a new roll of thermal printer inside the printer paper compartment as shown below. To order replacement thermal paper, call your local dealer and ask for Reichert replacement paper.

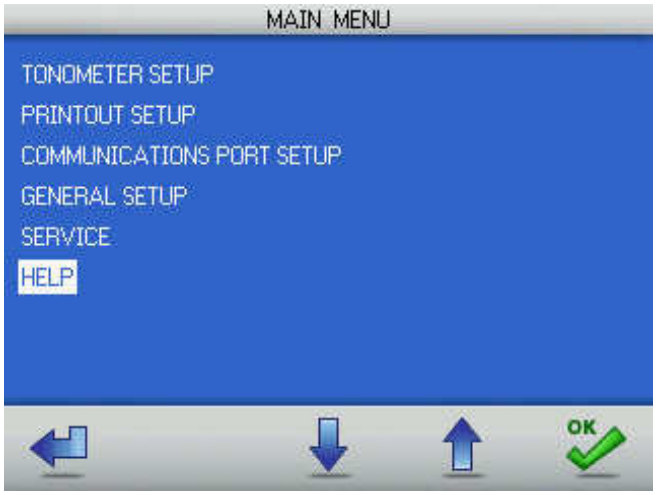
Printer Paper Replacement

# Troubleshooting

## Help Screens

The Reichert 7CR includes HELP screens, which provide useful information and tips on its operation. These screens are intended to be used as a quick reference to a selection of operations.

To access the HELP menu, touch the MENU icon. Press the DOWN ARROW icon until the cursor box is positioned on HELP. Then touch the SELECT icon to access the HELP screen.


# Troubleshooting (continued)

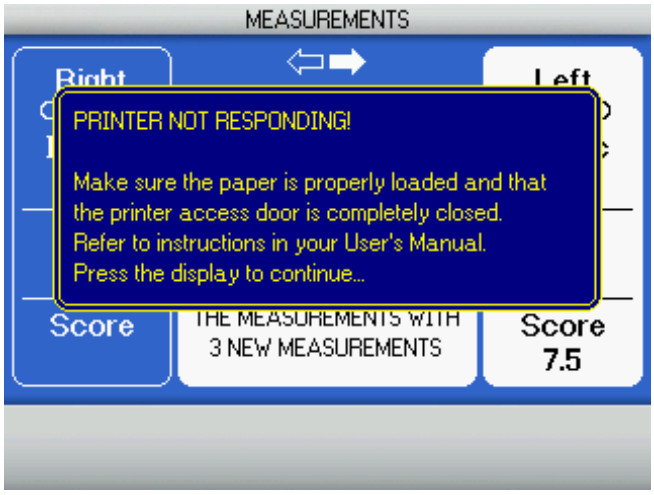
The following chart provides details of common problems and solutions for the Reichert 7.

| Definition | Probable Cause | Solution |
|---|---|---|
| Screen blank. | Unit in Sleep Mode.<br>ON/OFF Switch set to OFF.<br>Contrast is set too low.<br>Fuse(s) Blown. | Touch any icon.<br>Press the "\|" on the ON/OFF Switch.<br>Adjust contrast in Setup menu.<br>Replace blown fuse(s) (Refer to page 28).<br>Press the ON/OFF button to OFF, wait 2 minutes then push it to ON. |
| Instrument not responding to icon touch. | Instrument is "locked up" - Touch screen needs recalibrating. (re-boot unit while touching the screen to initiate calibration of the touch screen.) | Press on the "blue dot" displayed on the screen at different locations to re-calibrate the touch screen. |
| Position Patient message shown. | Patient not looking at green fixation LED. | Instruct patient to look for green LED, then move in toward headrest. |
| Does not find the eye (moves straight out, then goes straight back). | Dirty Positioning Windows.<br>External light confusing positioning system. | Clean the Positioning Windows (Refer to the Maintenance section of this manual).<br>Isolate sources of external light (e.g., incandescent or infrared light) and remove light source. |
| Finds one eye not the other. Infrared interference. | Light interference on measuring side. | Remove interference (e.g., infrared light source). |
| Will not take a reading. | Patient not holding still.<br>Patient's eye too far from Patient Window.<br>Patient not focusing on target (eye moving around).<br>Patient has dry eye.<br>Dirty Positioning Windows. | Encourage patient to remain still.<br>Have patient move toward nosepiece.<br>Have patient look only at target.<br>Have patient blink eyes.<br>Clean the Positioning Windows (Refer to the Maintenance section of this manual). |
| Asterisk readings or No Applanation readings. | Unit needs reboot of hardware.<br>Dirty Positioning Windows. | Unplug unit, wait 2 minutes then apply input power.<br>Clean the Positioning Windows (Refer to the Maintenance section of this manual). |
| Printer not printing. | Printer out of paper.<br>Not using Reichert thermal paper.<br>Printer paper in backwards. | Replace paper with Reichert P/N 12241.<br>Reverse the printer paper. |

# Troubleshooting (continued)

### Print-Related Errors

If your printer runs out of paper during a print cycle, the following message will appear.




**Note:** If the printer paper runs out before printing all the measurement data, the data will be stored. Once the printer paper is replaced, a complete print out of all measurement data will start.

# Classifications

The Reichert 7CR is classified as Class 1 Equipment.

Class 1 Equipment is equipment in which protection against electric shock does not rely on basic insulation only, but which includes an additional safety precaution in that means are provided for the connection of the equipment to a protective earth conductor in the fixed wiring of the installation in such a way which accessible metal parts cannot become live in the event of a failure of the basic insulation.

The Reichert 7CR is classified as Type B Equipment.

Type B Equipment provides an adequate degree of protection against electrical shock, particularly regarding allowable leakage currents and reliability of the protective earth connection.

The Reichert 7CR is classified as IPX0 Equipment.

IPX0 Equipment is ordinary equipment enclosed without protection against ingress of water.

According to the mode of operation, the Reichert 7CR is a Continuous Operation instrument.

**FEDERAL LAW RESTRICTS THIS DEVICE TO SALE BY OR ON THE ORDER OF A PHYSICIAN.**

# Guidance Tables

**Table 201 – Guidance and Manufacturer's Declaration**

## Electromagnetic Emissions

**All Equipment and Systems**

**Guidance and Manufacturer's Declaration – Electromagnetic Emissions**

The Reichert 7CR is intended for use in the electromagnetic environment specified below. The customer or user of the Reichert 7CR should ensure that it is used in such an environment.

| Emissions Test | Compliance | Electromagnetic Environment - Guidance - |
|---|---|---|
| RF Emissions<br>CISPR 11 | Class A,<br>Group 1 | The Reichert 7CR uses RF energy only for its internal function. Therefore, its RF emissions are very low and are not likely to cause any interference in nearby electronic equipment. |
| Harmonics<br>IEC 61000-3-2 | Class A | The Reichert 7CR is suitable for use in all establishments, including domestic establishments and those directly connected to the public low-voltage power supply network that supplies building for domestic power. |
| Flicker<br>IEC 61000-3-3 | Complies or N/A | |

**Table 202 – Guidance and Manufacturer's Declaration**

## Electromagnetic Immunity

**All Equipment and Systems**

**Guidance and Manufacturer's Declaration – Electromagnetic Immunity**

The Reichert 7CR is suitable for use in electromagnetic environment specified below. The customer or user of the Reichert 7CR should ensure that it is used in such an environment.

| Immunity Test | IEC 60601 Test Level | Compliance Level | Electromagnetic Environment - Guidance |
|---|---|---|---|
| ESD<br>IEC 61000-4-2 | ±6kV Contact<br>±8kV Air | ±6kV Contact<br>±8kV Air | Floors should be wood, concrete or ceramic tile. If floors are synthetic, the R/H should be at least 30%. |
| EFT<br>IEC 61000-4-4 | ±2kV Mains<br>±1kV I/Os | ±2kV Mains<br>±1kV I/Os | Mains power quality should be that of a typical residential, commercial or hospital environment. |
| Surge<br>IEC 61000-4-5 | ±1kV Differential<br>±2kV Common | ±1kV Differential<br>±2kV Common | Mains power quality should be that of a typical residential, commercial or hospital environment. |
| Voltage Dips/Dropout<br>IEC 61000-4-11 | >95% Dip for 0.5 Cycle<br>60% Dip for 5 Cycles<br>30% Dip for 25 Cycles<br>>95% Dip for 5 Seconds | >95% Dip for 0.5 Cycle<br>60% Dip for 5 Cycles<br>30% Dip for 25 Cycles<br>>95% Dip for 5 Seconds | Mains power quality should be that of a typical residential, commercial or hospital environment. If the user of the Reichert 7CR requires continued operation during power mains interruptions, it is recommended that the Reichert 7CR be powered from an uninterruptible power supply or battery. |
| Power Frequency 50/60Hz Magnetic Field<br>IEC 61000-4-8 | 3A/m | 3A/m | Power frequency magnetic fields should be that of a typical residential, commercial or hospital environment. |

# Guidance Tables (continued)

**Table 204 – Guidance and Manufacturer's Declaration**

## Electromagnetic Immunity

**Equipment and Systems that are NOT Life-supporting**

**Guidance and Manufacturer's Declaration – Electromagnetic Immunity**

The Reichert 7CR is intended for use in the electromagnetic environment specified below. The customer or user of the Reichert 7CR should ensure that it is used in such an environment.

| Immunity Test | IEC 60601 Test Level | Compliance Level | Electromagnetic Environment - Guidance |
|---|---|---|---|
| Conducted RF<br>IEC 61000-4-6 | 3 Vrms<br>150 kHz to 80 MHz | (V1) = 3 V/rms | Portable and mobile RF communications equipment should be no closer to any part of the Reichert 7CR, including cables, than the recommended separation distance calculated from the equation applicable to the frequency of the transmitter.<br><br>Recommended Separation Diatance:<br><br>d=(3.5/V1)(Sqrt P)<br><br>d=(3.5/E1)(Sqrt P)<br>80 to 800 MHz<br><br>d=(7/E1)(Sqrt P)<br>800 MHz to 2.5 GHz<br><br>Where P is the max output power rating of the transmitter in watts (W) according to the transmitter manufacturer and d is the recommended separation distance in meters (m).<br><br>Field strengths from fixed transmitters, as determined by an electromagnetic site survey, should be less than the compliance levels in each frequence range.<br><br>Interference may occur in the vicinity of equipment marked with the following symbol.<br><br>  |
| Radiated RF<br>IEC 61000-4-3 | 80 MHz to 2.5 GHz @ 3V/m | (E1) = 3 V/m | |

Note 1: At 80 MHz and 800 MHz, the higher frequency range applies.

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

* Field strengths from fixed transmitters, such as base stations for radio (cellular/cordless) telephones and land mobile radios, amateur radio, AM and FM radio broadcast and TV broadcast cannot be predicted theoretically with accuracy. To assess the electromagnetic environment due to fixed RF transmitters, an electromagnetic site survey should be considered. The measured field strength in the location in which the ME Equipment or ME System should be observed to verify normal operation. If abnormal performance is observed, additional measures many be necessary, such as re-orienting or relocating the ME Equipment or ME System.

* Over the frequency range 150 kHz to 80 MHz, field strengths should be less then [V1] V/m.

**Table 206 – Recommended Separation Distances between Portable and Mobile RF Communications Equipment and the** Reichert 7CR **for ME Equipment and ME Systems that are NOT Life-supporting.**

**Guidance and Manufacturer's Declaration - Electromagnetic Immunity**

**Recommended Separation Distances for between**

**Portable and Mobile RF Communications Equipment and the** Reichert 7CR

The Reichert 7CR is intended for use in the electromagnetic environment in which radiated RF disturbances are controlled. The customer or user of the Reichert 7CR can help prevent electromagnetic interference by maintaining a minimum distance between portable and mobile RF Communications Equipment and the Reichert 7CR as recommended below, according to the maximum output power of the communications equipment.

| Max Output Power of Transmitter (W) | Separation (m) 150kHz to 80 MHz d=(3.5/V1)(Sqrt P) | Separation (m) 80 to 800 MHz d=(3.5/E1)(Sqrt P) | Separation (m) 800MHz to 2.5GHz d=(7/E1)(Sqrt P) |
|---|---|---|---|
| 0.01 | 0.1166 | 0.1166 | 0.2333 |
| 0.1 | 0.3689 | 0.3689 | 0.7378 |
| 1 | 1.1666 | 1.1666 | 2.3333 |
| 10 | 3.6893 | 3.6893 | 7.3786 |
| 100 | 11.6666 | 11.6666 | 23.3333 |

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

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

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

# General Specifications

**Physical Dimensions**

Size:
Height: 19.8 in. (50.2 cm)
Width: 10.5 in. (26.7 cm)
Depth: 14.0 in. (35.6 cm)

Weight, unpacked: 23.0 lbs. (10.4 Kg)

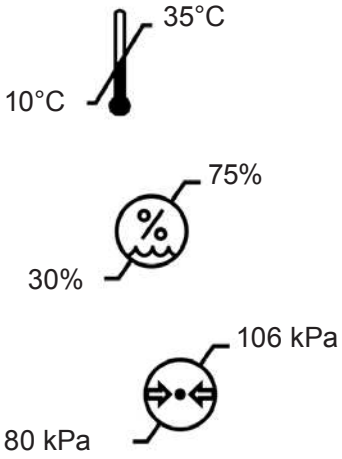
**Electrical**

Voltage: 100-240 VAC
Power: 90-85 VA
Frequency: 50/60 Hz
Fuses: 2.5A 250V 5 X 20mm SLO-BLO, RoH

Measurement Range:
7 – 60 mm Hg (ISO 8612 Tonometer Standard)

**Operational Conditions**

Environmental:
The environmental conditions are as follows:
Operating:
Temperature 10° C (50° F) to 35° C (95° F)
Relative Humidity: 30% to 75%
Atmospheric Pressure: 80 kPa (23.6 in. Hg) to 106 kPa (31.3 in. Hg)
Transportation & Storage:
Temperature -40° C (-40° F) to +70° C (158° F).
Relative Humidity: 10% to 80% (non-condensing)
Atmospheric Pressure: 50 kPa (14.8 in. Hg) to 106 kPa (31.3 in. Hg)




Exposure to extreme temperature conditions indicated above must not exceed 15 weeks.

## Disposal

This product does not generate any environmentally hazardous residues. At the end of its product service life, follow your local laws and ordinances regarding the proper disposal of this equipment.

## Software Revision

The software revision can be obtained by contacting Reichert, Inc.
The serial number identifies the manufacture date and will provide access to the software version.

# Warranty

This product is warranted by Reichert, Inc. (“Reichert”) against defective material and workmanship under normal use for a period of one year from the date of invoice to the original purchaser. (An authorized dealer shall not be considered an original purchaser.) Under this warranty, Reichert’s sole obligation is to repair or replace the defective part or product at Reichert’s discretion.

This warranty applies to new products and does not apply to a product that has been tampered with, altered in any way, misused, damaged by accident or negligence, or that has the serial number removed, altered or effaced. Nor shall this warranty be extended to a product installed or operated in a manner not in accordance with the applicable Reichert instruction manual, nor to a product that has been sold, serviced, installed or repaired other than by a Reichert factory, Technical Service Center, or authorized Reichert, Inc. Dealer.

Lamps, bulbs, charts, cards and other expendable items are not covered by this warranty.

All claims under this warranty must be in writing directed to the Reichert factory, Technical Service Center, or authorized instrument dealer making the original sale and must be accompanied by a copy of the purchaser’s invoice.

This warranty is in lieu of all other warranties implied or expressed. All implied warranties of merchantability or fitness for a particular use are hereby disclaimed. No representative or other person is authorized to make any other obligations for Reichert. Reichert shall not be liable for any special, incidental, or consequent damages for any negligence, breach of warranty, strict liability or any other damages resulting from or relating to design, manufacture, sale, use or handling of the product.

## PATENT WARRANTY

If notified promptly in writing of any action brought against the purchaser based on a claim that the instrument infringes a U.S. Patent, Reichert will defend such action at its expense and will pay costs and damages awarded in any such action, provided that Reichert shall have sole control of the defense of any such action with information and assistance (at Reichert’s expense) for such defense, and of all negotiation for the settlement and compromise thereof.

## PRODUCT CHANGES

Reichert reserves the right to make changes in design or to make additions to or improvements in its products without obligation to add such to products previously manufactured.

## CLAIMS FOR SHORTAGES

We use extreme care in selection, checking, rechecking and packing to eliminate the possibility of error. If any shipping errors are discovered:

1. Carefully go through the packing materials to be sure nothing was inadvertently overlooked when the unit was unpacked.
2. Call the dealer you purchased the product from and report the shortage. The materials are packed at the factory and none should be missing if the box has never been opened.
3. Claims should be filed within 30 days.

## CLAIMS FOR DAMAGES IN TRANSIT

Our shipping responsibility ceases with the safe delivery in good condition to the transportation company. Claims for loss or damage in transit should be made promptly and directly to the transportation company.

If, upon delivery, the outside of the packing case shows evidence of rough handling or damage, the transportation company's agent should be requested to make a "Received in Bad Order" notation on the delivery receipt. If within 48 hours of delivery, concealed damage is noted upon unpacking the shipment and no exterior evidence of rough handling is apparent, the transportation company should be requested to make out a "Bad Order" report. This procedure is necessary in order for the dealer to maintain the right of recovery from the carrier.