CT100
CT200

Contact Applanation Tonometer

User's Guide

Reichert
Ophthalmic Instruments

Introduction / Precautions

Congratulations on your purchase of the Reichert CT100/CT200 Contact Tonometer. The CT100/CT200 Contact Tonometers are to be used in conjunction with a slit lamp in order to measure the intraocular pressure of the human eye according to the “Goldmann” method.

This User’s Guide is designed as a training and reference manual. We recommend you carefully read and follow the steps in this guide to ensure optimum performance from your new instrument. Please retain this guide for future reference and to share with other users. Additional copies can be obtained from your authorized Reichert dealer or from the Reichert Customer Service department. Contact information is provided at the end of this manual.

CT100 Package Contents
Tonometer body
2 Measurement Prisms
Mounting bracket and Screw
Calibration Rod and Screw
User’s Guide

CT200 Package Contents
Tonometer Body
2 Measurement Prisms
Calibration Rod and Screw
User’s Guide
(Mounting Bracket Sold Separately)

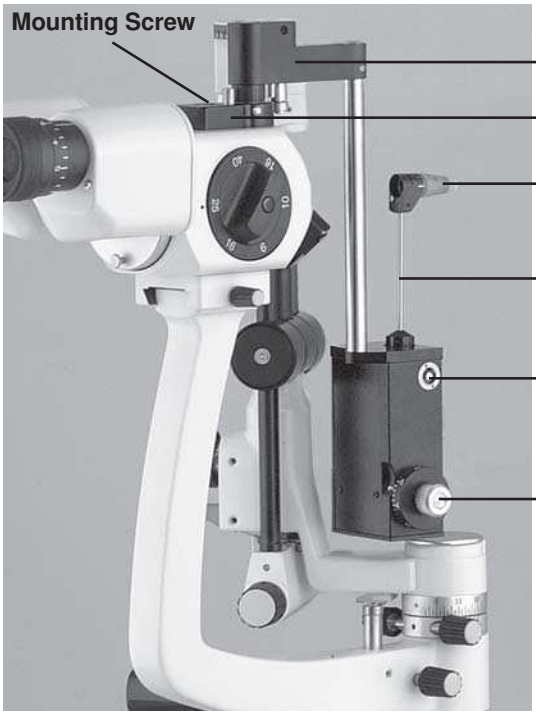
WARNING: AVOID USING THE CT100/CT200 IN CASES WHERE EYE INFECTIONS OR INJURED CORNEAS ARE PRESENT.

WARNING: EXAMINATIONS SHOULD BE CONDUCTED USING ONLY CLEAN AND DISINFECTED MEASURING PRISMS. TONOMETER PRISMS ARE NOT SHIPPED IN A DISINFECTED STATE AND SHOULD ALWAYS BE DISINFECTED BEFORE EACH USE. FOLLOW THE DISINFECTING AND CLEANING GUIDELINES INDICATED IN THIS MANUAL. INCORECT MEDICAL DISINFECTING CAN CAUSE PATIENT INJURY.

WARNING: BEFORE EACH USE THE CONTACT SURFACE OF THE PRISM SHOULD BE EXAMINED UNDER MAGNIFICATION FOR CONTAMINATION OR DAMAGE (SUCH AS SCRATCHES, CHIPS, OR SHARP EDGES).

WARNING: ONLY QUALIFIED OPERATORS MAY OPERATE THE CT100/CT200. OPERATOR TRAINING IS THE RESPONSIBILITY OF THE EQUIPMENT OWNER. THE CT100 / CT200 TONOMETER SHOULD BE USED IN STRICT ACCORDANCE WITH THE INSTRUCTIONS OUTLINED IN THIS USERS GUIDE. THE SAFETY OF THE PATIENT AND THE PERFORMANCE OF THE INSTRUMENT CANNOT BE GUARANTEED IF USED IN A MANNER NOT SPECIFIED BY REICHERT OPHTHALMIC INSTRUMENTS.

CT100 Features and Installation

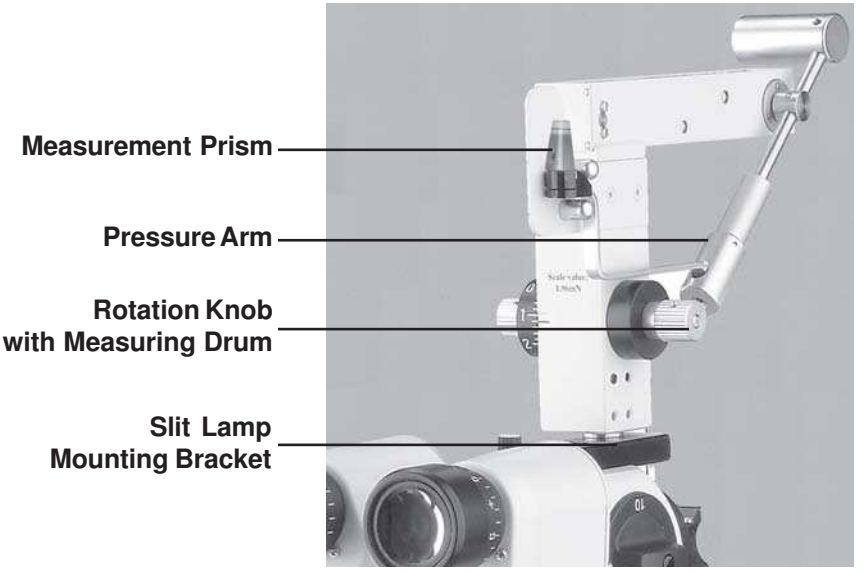


CT100 Tonometer Installation

Installation Instructions

Attach the CT100 tonometer to the top of the slit lamp microscope using the mounting bracket and slotted screw provided . The bracket is intended to be permanently mounted, enabling the operator to conveniently swing the CT100 into position when required. However, the tonometer can be easily removed if required by simply pulling it off the mounting bracket. Applanation is viewed monocularly through the left ocular.

CT200 Features and Installation



CT200 Tonometer Installation

Installation Instructions

Attach the CT200 tonometer to the top of the slit lamp microscope using the mounting bracket and slotted screw (sold separately). The bracket is intended to be permanently mounted, enabling the operator to conveniently swing the CT200 into position when required. However, the tonometer can be easily removed if required by simply pulling it off the mounting bracket. Applanation is viewed monocularly through the left ocular.

CT100 / 200 Operation

General Concerns
The following instructions assume that the operator is trained and familiar with the principles of contact applanation tonometery. Operators should follow these instructions carefully to ensure patient safety, patient comfort, and accurate measurement results.
It is recommended that three measurements be made on each eye. Measurement values are deemed correct if they remain within a range of ± 0.5 mmHg.

When measuring an eye for a prolonged period of time, drying of the corneal epithelium may occur. This may make it difficult to obtain accurate measurements. To avoid this possibility, measurements should be made as quickly as possible after anesthetization and on each eye alternately.

The applanation prism is graduated from 0 to 180 degrees. When the cornea is spherical, measurements can be made at any meridianal orientation of the prism. In the presence of three or more diopters of corneal astigmatism, measurements should be made in the direction of 43 degrees to the meridian of lower power.

Patient Preparation
It is beneficial to have the patient at ease during the testing procedure. Nervousness, excitement, or strain can adversely affect the measurement results. It is suggested that the examiner put the patient at ease by explaining that there is no discomfort associated with the procedure. With the eyes properly anesthetized and wide open, the patient will not feel contact.

1. Both eyes must always be anesthesized to reduce movement of the eyelids during examination.
2. Place a flourescein paper strip near the external canthus in the lower conjunctival sac. After a few seconds the lacrimal fluid is sufficiently colored and the paper can be removed.
3. Position the patient properly and comfortably in front of the slit lamp.

Instrument Preparation
1. Clean the measurement prism with an antiseptic fluid that does not damage plastic.
2. Set the slit lamp magnification at 10x and make sure that the eyepieces are focused correctly.
3. Set the slit lamp illumination to the lowest setting.
4. Instruct the patient to look straight ahead.
5. Bring the cobalt blue filter into the beam of the slit lamp and open the slit diaphragm fully.

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7. Swing the tonometer into position and move the illumination unit until the angle between the illumination unit and the microscope is about 60 degrees. This will ensure a bright, reflection-free image for accurate measurements.

9. Bring the pressure arm into the notch position so that the axis of the measuring prism and the microscope coincide.

10. Turn the measurement drum to setting 1.

Taking a Pressure Measurement

1. To ensure adequate distribution of lacrimal fluid and fluorescein, ask the patient to close both eyes briefly just before taking a measurement.

3. Looking at the patient's eye from the side (not through the microscope), move the slit lamp forward until the measurement prism contacts the eye in the center of the cornea on the pupillary area. The limbus of the cornea will be illuminated with a bluish hue. As soon as this illumination is observed, cease forward movement of the slit lamp immediately.

4. Look through the left ocular of the slit lamp and observe the steady pulsation of the two flourescein semi-circles. This pulsation indicates that the tonometer is in the correct measuring position.

   NOTE: At the 1 gram setting, the size of the semi-circles may vary depending on the intraocular pressure

5. Adjust the slit lamp's elevation and lateral position with the joystick until the flattened area is seen as two semi-circles of equal size in the middle of the field of view (Figure 1).

6. Gradually increase the pressure on the eye by turning the drum until the inner borders of the two fluorescein rings just touch each other. The edges should overlap with each pulsation of the eye (Figure 2). The width of the fluorescein ring around the contact position of the measuring prism should be about one tenth of the diameter of the applanation surface.

7. The intraocular pressure in mmHg is calculated by multiplying the value on the drum dial by ten.

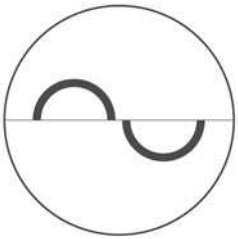

Figure 1

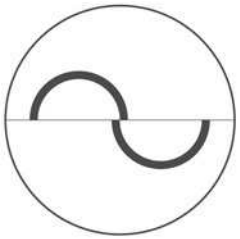

Figure 2

Specifications and Maintenance

Equipment Type: Class I Medical Device. Complies with ISO 8612

Measurement Range: 0 - 80 mmHg

Transportation, Storage & Operational Environmental Conditions:

During storage and transportation
- Ambient temperature (maximum 4 months): -10°C (14°F) to +60°C (140°F)
- Relative humidity: 10% to 90%
- Atmospheric pressure: 50 kPa to 106 kPa

The same limitations apply to daily use with the exception of:
- Ambient temperature: 10°C (59°F) to 30°C (86°F)

Calibration
NOTE: Calibration verification of the CT100 / CT200 tonometers can be performed by the operator. If the instrument is found to be out of calibration it should be returned to an Authorizerd Reichert service center for calibration.

NOTE: The use of the calibration rod depends upon gravitational force. Therefore, to compensate for the possibility that the instrument is not level, it is necessary to take two readings. One reading should be taken followed by another with the tonometer's position altered by 180 degrees. The operator should then average these two readings to compensate for any out-of-level conditions. In normal use the tonometer does not need to be level to ensure accurate measurement results.

CAUTION: When checking the calibration of the tonometer, make sure to turn the measuring drum very slowly. Turning the drum too quickly can cause extreme inaccuracy.

Calibration Procedure
Start with the measuring drum at the 0 g position. With the prism in measurement position, lightly push on the pressure arm. The arm should move from one stop to the other and remain there. Now set the drum at -0.1g. Hold the pressure arm between the two stops. On releasing, the arm should move towards the stop on the examiner's side. The same procedure should be performed at +0.1g and the arm should fall toward the patient's side.

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Specifications and Maintenance

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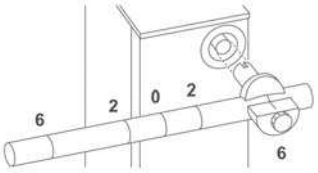
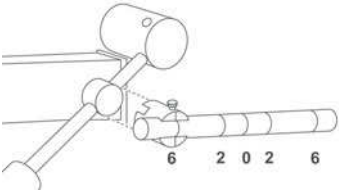
For the CT100, set the calibration rod at the 2g position and insert the rod into the holder on the side of the tonometer so that the longer portion of the calibration rod is pointing towards the examiner. For the CT200, attach the calibration rod to the axis point of the pressure arm so that the longer portion of the rod is pointing towards the patient.



CT100 Calibration Rod



CT200 Calibration Rod

The pressure arm should move from stop to stop when the drum is rotated from 1.9 to 2.1 g. Follow the same procedure with the calibration rod set at the 6 g position. The corresponding check points are 5.9 and 6.1 g on the measurement drum.

Cleaning:

The measuring prism should always be disinfected before use. Run the measuring prism under cold water for 30 to 60 seconds before disinfecting. If the prism becomes visibly contaminated, rub the prism with a cotton-wool ball while rinsing with cold water. A mild soap may be used as well. Disinfect the measuring prism using an aqueous Hydrogen Peroxide solution of 3% for 10 minutes. Thoroughly rinse the measuring prism under cold water for at least 10 minutes. Dry the measuring prism with a clean, soft, single use tissue. Store the measuring prism in a clean, dry container.

NOTE: Do not use alcohol, acetone, UV radiation, or water above 140 degrees F (60 C) to sterilize the measuring prisms. Also, do not immerse the measuring prism in water for more than 1 hour.

Product Warranty

This product is warranted by Reichert, Inc. 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 which has had 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 which has been sold, serviced, installed or repaired other than by a Reichert factory, Technical Service Center, or authorized Reichert Dealer.

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

All claims under this warranty must be in writing and 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.

Product Warranty

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 must be filed within 30 days of purchase.

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.