



INSTRUCTIONS FOR USE
Aplplanation tonometer

AT 900[®] / 870

23. Edition / 2017 – 01

HS HAAG-STREIT
DIAGNOSTICS

INSTRUCTIONS FOR USE

Applanation tonometer

AT 900[®] / 870

23. Edition / 2017 – 01

Introduction

Thank you for choosing a HAAG-STREIT device. Provided you comply carefully with the regulations in this instructions for use, we can guarantee the reliable and unproblematic use of our product.

Purpose of use

The manual operated Goldman tonometer is an appliance that serves to measure intraocular pressure, according to the Goldman method. The measuring of the pressure requires to maintain a uniform applanation of the surface of the cornea. It is specially indicated in Glaucoma disease.

Contraindication

There is no absolute contraindication for execution of the tonometry. Appropriate professional assessment and caution are necessary.



WARNING!

Applanation tonometry may only be conducted by appropriately trained and qualified medical personnel.



WARNING!

Read the instruction manual carefully before commissioning this product. It contains important information regarding the safety of the user and patient.



NOTE!

Federal law restricts this device to sale by or on the order of a physician or licensed practitioner.

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1. Safety



DANGER!

Failure to comply with these instructions may result in material damage or pose a danger to patients or users.



WARNING!

These warnings must absolutely be complied with to guarantee safe operation of the device and to avoid any danger to users and to patients.



NOTE!

Important information: please read carefully.

1.1 Areas of application of the device

The device is intended for use in doctor's practices, hospitals, and optometrists' and opticians' premises.

1.2 Ambient conditions

Transport:	Temperature	from	-40°C	to	+70°C
	Air pressure	from	500 hPa	to	1060 hPa
	Relative humidity	from	10%	to	95%
Storage:	Temperature	from	-10°C	to	+55°C
	Air pressure	from	700 hPa	to	1060 hPa
	Relative humidity	from	10%	to	95%
Use:	Temperature	from	+10°C	to	+35°C
	Air pressure	from	800 hPa	to	1060 hPa
	Relative humidity	from	30%	to	90%

1.3 Shipment and unpacking

- Before you unpack the appliance, check whether the packaging shows traces of incorrect handling or damage. If this is the case, notify the transport company that has delivered the goods to you. Unpack the equipment together with a representative of the transport company. Make a report of any damaged parts. This report must be signed by you and by the representative of the transport company.
- Leave the device in the packaging for a few hours before unpacking it (condensation).
- Check the appliance for damage after it is unpacked. Return defective appliances in the appropriate packaging.

- Store packaging material carefully, so that it can be used for possible returns or when moving.



NOTE!

Check the calibration of the instrument before first use according to the instructions in section 7.3.

1.4 Installation warnings



WARNING!

Do not modify this equipment without authorization of the manufacturer. Installation and repairs may only be performed by trained specialists.



NOTE!

- When performing assembly on appliances from other manufacturers, the connecting dimensions of the diverse tonometer models are to be taken into account!
- Check: Are the connection parts properly positioned (tonometer on the slit lamp, measuring prisms)?

1.5 Operation, environment



WARNING!

- The examination is to be performed at the medical professional's discretion and consideration in cases of active infections and lesions of the eye. Certain conditions could falsify measured values and the procedure may interfere with the patient's condition.
- Use only original HAAG-STREIT Goldmann tonometer measuring prisms or the sterile disposable measuring prisms TonoSafe from HAAG-STREIT.
- Strong magnetic fields may falsify the measurement results.



NOTE!

This appliance must only be operated by qualified and trained personnel. The owner is responsible for their training.

1.6 Disinfection



NOTE!

The device does not need to be disinfected. For more information on cleaning, please refer to the 'Maintenance' chapter.

1.6.1 Cleaning and disinfection of the measuring prism



DANGER!

The measuring prisms are made of PMMA. Please take note of the following restrictions:

- Do not disinfect with alcohol
- Do not clean with acetone
- Do not disinfect using UV radiation
- Do not sterilise using steam or ethylene oxide
- Do not expose to temperatures above 60°C



WARNING!

Reusable measuring prisms are not shipped disinfected and must be cleaned and disinfected before their first use in accordance with the separate instructions for use on the cleaning and disinfection of tonometer measuring prisms, contact glasses, and DESINSET (HS item no. 7220315).

- Preparation may only be conducted by qualified and trained personnel. Their training is the responsibility of the user.
- Appropriate professional assessment and caution are necessary.
- Only use clean, undamaged, and disinfected measuring prisms!
- Please observe the separate instructions for use on the cleaning and disinfection of tonometer measuring prisms, contact glasses, and DESINSET (HS item no. 7220315)!
- The operator shall be liable in the event of non-observance of the cleaning and disinfecting process!



NOTE!

- Only those disinfectants tested by HAAG-STREIT for material compatibility may be used for disinfection.
- The current list is enclosed with every tonometer and measuring prism, and can also be found on the HAAG-STREIT AG website (www.HAAG-STREIT.com).
- The separate instructions for use on the cleaning and disinfection of tonometer measuring prisms, contact glasses, and DESINSET is to be consulted regarding the exact functioning, concentration, working times, and idle times.
- Improper preparation can result in the transmission of diseases to the patient and user as well as damage to the measuring prism.



- Residue from cleaning agents and disinfectants may irritate and burn the patient's eye.
- As a rule, the measuring prisms may be prepared together with each other, but not with any other products.
- In order to achieve a efficient disinfection and storage of tonometer measuring prisms, we recommend the use of our DESINSET. For a selection of cleaning and disinfection agents please refer to the instructions for use "Cleaning and disinfection" and to our "List of Disinfectants". The efficacy of the disinfectants on tonometer measuring prisms must be guaranteed by the user or the reprocessing responsible person with the validation of their own disinfection process.
- The validation report is available from HAAG-STREIT on request.
- A summary of the validation report can be found on the HAAG-STREIT website (www.HAAG-STREIT.com).
- The operator accepts liability for the use of other disinfectants.
- Single-use prisms must be replaced after every examination - see separate instructions for use.
- The instructions for use referred to above, the brief instructions on the disinfection of tonometer measuring prisms and additional information can be found on our website www.HAAG-STREIT.com at any time.

1.6.2 Visual inspection of the measuring prisms for damages



DANGER!

Never use damaged measuring prisms.

Prior to every use, the contact surface of the measuring prism must be inspected for contaminants or damage (scratches, cracks and sharp edges). **This must be performed with a slit lamp microscope at 10x to 16x magnification.**

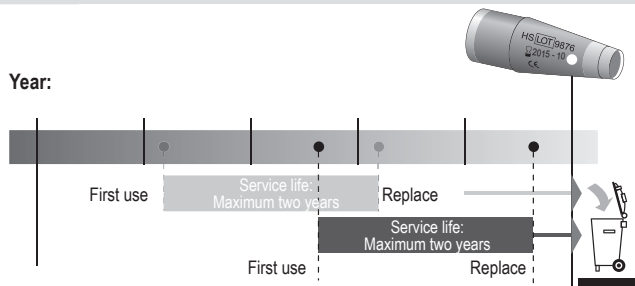
1.6.3 Service life of reusable measuring prisms



WARNING!

How long can measuring prisms be used?

Due to the large number of variables to be considered (type and concentration of the disinfectant used, number of patients, handling, etc.) it is practically impossible to provide exact information on how often and/or how long a measuring prism can be used under safe conditions. The measuring prisms are stamped with an expiry date (YYMM). They must not be used beyond this date. HAAG-STREIT recommends a maximum service life of two years before the expiry date. This service life applies subject to normal conditions of use, i.e., in compliance with the instructions contained in these instructions for use. The service life starts with the first use. The above-mentioned time periods do not apply to damaged measuring prisms; these must be immediately replaced.



1.6.4 Tonosafe



NOTE!

Tonosafe was developed to avoid the necessary cleaning and disinfection of measuring prisms from applanation tonometers. Tonosafe is a disposable applanation and optical duplication prism for Goldmann and Perkins applanation tonometers, for single use.

Additional details can be found in the separate instructions for use.



1.6.5 Monthly device checks

The tonometer must be checked on a monthly basis as described in the 'Maintenance' chapter. A check will be absolutely necessary if external force is applied (e.g., striking or dropping the appliance).



NOTE!

If a repair is necessary, please contact your HAAG-STREIT representative.

1.7 Warranty and product liability

- Haag-Streit products must be used only for the purposes and in the manner described in the documents distributed with the product.
- The product must be treated as described in the 'Safety' chapter. Improper handling can damage the product. This would void all guarantee claims.
- Continued use of a product damaged by incorrect handling may lead to personal injury. In such a case, the manufacturer will not accept any liability.
- Haag-Streit does not grant any warranties, either expressed or implied, including implied warranties of merchantability or fitness for a particular use.
- Haag-Streit expressly disclaims liability for incidental or consequential damage resulting from the use of the product.
- This product is covered by a limited warranty granted by your seller.

For USA only:

- This product is covered by a limited warranty, which may be reviewed at www.haag-streit-usa.com.

1.8 Symbols



European certificate of conformity



General warning: Read the accompanying documentation



Year of production



Manufacturer



HS reference number



Serial number



Expiry date (2017-10 = end of October 2017)



LOT number

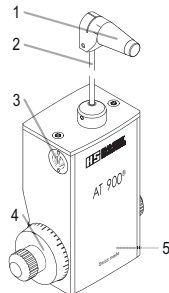
2. Introduction

The applanation tonometer functions according to the Goldmann method: measurement of the pressure required to maintain a uniform applanation of the surface of the cornea. The exact measurement of the applanation surface is performed at 10x magnification on the slit lamp.

The pressure is measured on the slit lamp with the patient seated and is part of a routine examination within the scope of conventional slit lamp microscopy.

2.1 Overview

1. Measuring prisms
2. Sensor arm
3. Insert for control weight
4. Rotating knob with measuring drum
5. Type plate (underside)



3. Appliance assembly / installation



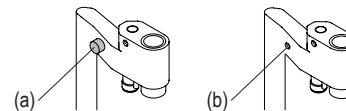
WARNING!

Installation, repairs and modifications may only be performed by trained specialists.

3.1 AT 900 Model R

A pivot is required for use of the Applanation Tonometer AT 900 model R on the BM 900 slit lamp. It is assembled as follows:

1. Unscrew the mounting screw found at the top, on the microscope's middle cylinder housing.
2. Leave the spring in the aperture.
3. Position and screw on tightly the pivot for the tonometer.
4. Place the tonometer bearer arm on the pivot's pin and swivel the tonometer to the right until it snaps into position. The tonometer will remain in this position even when not in use.
5. When using the BI 900, BM 900 and BM 900 V, the stop peg must be assembled (a), and when using the BC 900 or BD 900, it must be removed (b).

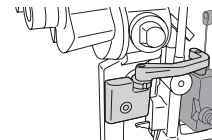


3.2 AT 900 Model T

The Applanation Tonometer is tucked into one of the holes on the horizontal guide plate over the slit lamp axis using the peg from the tonometer base.

3.3 AT 900 Model BQ

Connect the tonometer at the provided interface to the right side of the microscope arm.



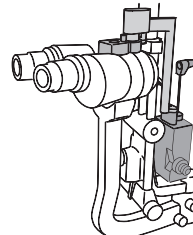
3.4 Tonometer AT 870



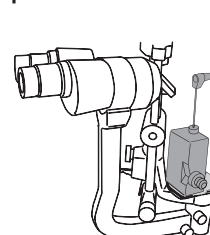
NOTE!

The instructions for appliances from other manufacturers are to be observed.

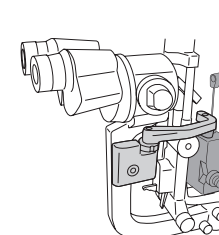
3.5 Which slit lamp with which tonometer



AT 900 model R



AT 900 model T



AT 900 model BQ

	Model R	Model T	Model BQ	AT 870
BD 900	●			
BM 900	●	●		
BI 900	●	●		
BP 900		●	●	
BQ 900		●	●	
BX 900		●	●	
Various				●

3.6 Description of models

- The Applanation Tonometer **AT 900 model R** can be left on the slit lamp permanently. It is fastened to the microscope on a mounting base and swivelled in front of the microscope for the examination. The observation of the applanated surface is conducted monocularly – only through the left eyepiece.
- The Applanation Tonometer **AT 900 model T** is set on the guide plate over the slit lamp axis, for tonometry purposes. The instrument can be moved between two positions on the guide plate for observation through the right or left eyepiece. The sensor arm with the measuring prism projects from the underside into the beam path of the microscope and the illumination.
- The Applanation Tonometer **AT 900 model BQ** has a working position and two resting positions. To set the correct angle of incidence of the illumination, the tonometer is swivelled and the illumination apparatus is positioned to the left of the tonometer bracket. In this position, the patient's left and right eyes can be easily examined (no 60° position). The applanated surface is observed monocularly through the right eyepiece of the stereo microscope.
- The Applanation Tonometer **AT 870** is positioned over the slit lamp's (from other manufacturer) microscope. The feeler arm projects into the microscope and illumination beam path from above. The tonometer is ready for use with a single swivel movement of the feeler arm.



NOTE!

The instructions for appliances from other manufacturers are to be observed.

4. Commissioning



WARNING!

It is imperative to read the 'Safety' chapter and to observe its precautions before operating the equipment.



NOTE!

A smooth operation can only be guaranteed with the use of original HAAG-STREIT measuring prisms and Tonosafe.

5. Operation



WARNING!

Reusable measuring prisms must be cleaned and disinfected after every examination.

5.1 Astigmatism

- If the cornea is spherical, measurements can be taken on any meridian, but it is most convenient to measure on the 0° meridian.
- The choice of meridian is of significance, however, when measuring eyes with corneal astigmatism greater than 3 dioptres, since the flattened area is not circular but elliptical.
- It has been calculated that, in cases of greater corneal astigmatism, a surface of 7.354 mm² (ø 3.06 mm) is applanated if the measuring prism is at an angle of 43° (mark (A)) to the meridian of the greatest radius.

Example: If the corneal astigmatism measures

$$6.5 \text{ mm} / 30^\circ = 52.0 \text{ dpt} / 30^\circ \text{ and}$$

$$8.5 \text{ mm} / 120^\circ = 40.0 \text{ dpt} / 120^\circ$$

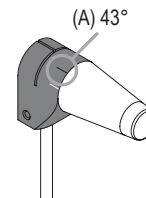
the 120° graduation mark on the prism is set on the mark (A) of the prism holder.

If, on the contrary, the measurements are

$$6.5 \text{ mm} / 120^\circ = 40.0 \text{ dpt} / 120^\circ \text{ and}$$

$$8.5 \text{ mm} / 30^\circ = 52.0 \text{ dpt} / 30^\circ$$

then the 30° graduation mark is set on the mark (A), meaning that simply the axis position of the largest radius is placed on the mark (A).



5.2 How pressure is measured

The applanation tonometer functions according to the 'Goldmann method': measurement of the pressure required to maintain a uniform applanation of the surface of the cornea.

- The readings obtained are based on the assumption that a cornea with a 'normal' thickness is being measured. (a different corneal thickness leads to changes in the measured IOP) A 'normal' corneal thickness is considered to fall within the range of 530 to 560 Mikrometer.

- If wrong measuring results are suspected, please conduct a functional verification in accordance with Section 'Maintenance'.

5.3 Preparing the patient



NOTE!

A smooth operation can only be guaranteed with the use of original HAAG-STREIT measuring prisms and Tonosafe.

1. Anaesthetise each eye
2. Apply Fluorescein into the eye to be examined
3. The correct eye height of the patient can be set via the chin rest.

5.4 Patient instructions

1. Press the head firmly against the chin and forehead rests.
2. The patient must look straight forward. If necessary, the small fixing light can be used to steady the eyes.
3. It is recommended that the patient be repeatedly reminded to keep his eyes open wide during the examination. It might be necessary for the examiner to keep the eye open by splaying the eyelids with thumb and index finger.
4. This must be done without applying any pressure to the eye.

5.5 Preparation of slit lamp and tonometer

For all HAAG-STREIT slit lamps and tonometers

1. Before the examination, the eyepieces must be adjusted correctly to the examiner.
2. Set the magnification to 10x.
3. Adjust the illumination to medium intensity.
4. Position the blue filter in the beam path of the slit lamp's illumination apparatus and open the slit diaphragm fully.
5. Insert the disinfected measuring prism into the (0° position) holder on the sensor arm. For Tonosafe, see the separate instructions for use.
6. Snap the sensor arm into place so that the axes of the measuring prism and of the microscope align.
7. Set the measuring drum to the first calibration line.

AT 900 model R and AT 900 model BQ

1. Swing the illumination apparatus to the left.
2. Release the tonometer from the dwell position to the right of the microscope, and swing it forward until it locks in the measuring position.
3. From the left, bring the illumination apparatus into contact with the tonometer bearer arm. This is the only illumination position in which both the patient's left

and right eyes can be easily examined (no 60° position). This arrangement facilitates the splaying of the patient's eyelids, should this be necessary for measurement. The illumination of the applanated surface through the measuring prism is practically reflection-free.

Observation: with AT 900 model R in the left eyepiece
with AT 900 model BQ in the right eyepiece

AT 900 model T

1. For an examination through the tonometer's left or right eyepiece, the angle between the illumination instrument and the microscope should be approx. 60° so that the image is bright and reflection-free. Alternatively: lighting through the measuring prism at approx. 10°.

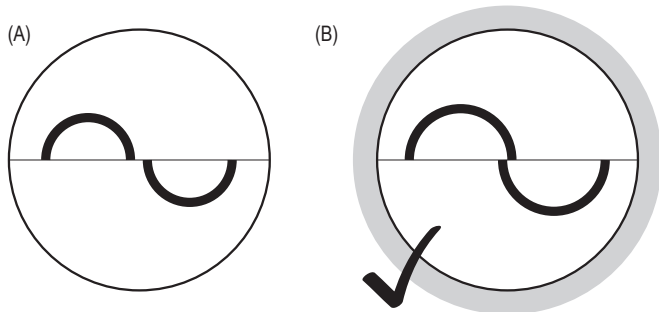
AT 870

1. Swing the sensor arm with the measuring prism into the beam path of the microscope and the illumination.
2. The angle between the illumination equipment and the microscope should be approximately 60° so that the image appears bright and free of reflections. Alternatively: lighting through the measuring prism at approx. 10°.
3. Set the measuring drum to the first calibration line.
4. Set a mid-level illumination intensity.

5.6 Measuring correctly

1. Immediately before taking measurements, the patient should close his eyes briefly so that the cornea becomes sufficiently moistened with fluorescein-impregnated tear fluid.
2. By moving the slit lamp, the measuring prism comes into contact with the centre of the cornea over the pupillary area.
3. During contact, the cornea's limbus takes on a bluish glow. This glow can be best observed with the naked eye from the opposite side of the illumination apparatus.
4. When the limbus glows, stop moving the slit lamp immediately.
5. After contact is made, viewing is conducted through the microscope. The uniform pulsation of the two semi circular fluorescein bands, which could be of different sizes in drum setting 1 depending upon inter-ocular pressure, shows that the tonometer is in the right measuring position.
6. Any necessary corrections are done using the slit lamp control lever, until the flattened surface is observed in the form of two semicircles of similar size in the middle of the visual field (A).
7. Smaller changes in the depth of the slit lamp using the control lever do not affect the size of the semicircles.

8. The pressure on the eye is increased by turning the tonometer measuring drum until the inner borders of both fluorescein bands just touch = correct setting (B).
9. When the eye pulsates, both semi circles cross over each other.
10. The width of the fluorescein band around the contact point of the measuring prism should be about 1/10 of the diameter of the applanation surface (0.3 mm).
11. Reading the scale value:
 - Reading the value
 - and multiplying by 10
 - yields the inter-ocular pressure in mm Hg



5.7 Sources of error

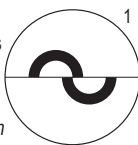
Ocular images

Fluorescein band incorrect	1 – 2
Wrong distance to patient	3 – 9
Position too far to the right / left	5 – 9
Position too high / low	10 – 14
Incorrect pressure	15 – 18

Fluorescein band too wide (1)

The measuring prism was not dried after cleaning or the eyelids came into contact with the measuring prism during measurement, or too much fluorescein has been used.

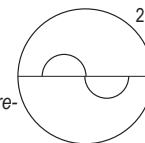
➔ *The slit lamp must be pulled back and the measuring prism dried with a lint-free cloth (e.g., made of cellulose).*



Fluorescein band too small (2)

The tear fluid dried during the longer-lasting measuring.

➔ *Allow the patient to close his eyes a few times and then repeat the measurement.*

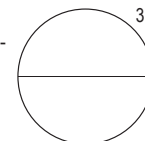


5.7.1 Wrong distance to patient

No semi circular image, only centre line is visible (3)

The measuring prism is not coming into contact with the cornea! If the patient draws his head back slightly, irregular pulsations will be caused because the measuring prism is touching the eye only intermittently. If the patient retreats even further, the fluorescein rings will disappear completely.

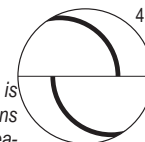
➔ *Instruct the patient to adopt the correct position.*



Only parts of both oversize semicircles are visible (4)

If the slit lamp is pushed too far against the patient, or if the patient moves toward the slit lamp, the sensor arm will push against a spring stop. The applanation surface is too large.

➔ *The image does not change when the measuring drum is turned. Pull the slit lamp back until the uniform pulsations of a correspondingly smaller surface show the correct measuring position and pressure changes immediately cause applanation surface changes.*

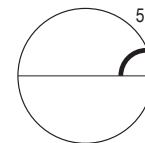


5.7.2 Position too far to the right / left

Only part of the upper semicircle (5)

Measuring prism not centred on the eye, eye much too far to the right.

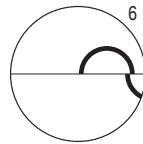
➔ *Using the control lever, move the slit lamp to the right.*



Whole upper semicircle – part of the lower semicircle (6)

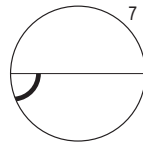
Measuring prism not centred on the eye, eye still too far to the right.

➔ Using the control lever, move the slit lamp to the right.

**Whole lower semicircle – part of the upper semicircle (7)**

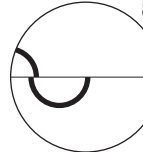
Measuring prism not centred on the eye, eye still too far to the left.

➔ Using the control lever, move the slit lamp to the left.

**Only part of the lower semicircle (8)**

Measuring prism not centred on the eye, eye much too far to the left.

➔ Using the control lever, move the slit lamp to the left.

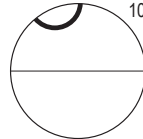
**Correct setting! (9)**

Two semicircles appear exactly in the middle of the eyepiece.

**5.7.3 Position too high / low****Only part of a semicircle in the upper half (10)**

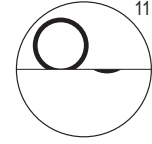
Measuring prism not centred on the eye, eye far too high.

➔ Using the control lever, move the slit lamp upwards.

**Nearly entire circle above, incomplete circle below (12)**

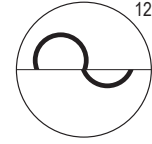
Measuring prism not centred on the eye, eye still too high.

➔ Using the control lever, move the slit lamp upwards.

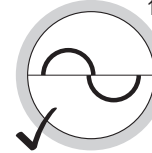
**Two incomplete circles, the larger one on top (13)**

Measuring prism not centred on the eye, eye still too high.

➔ Using the control lever, move the slit lamp upwards.

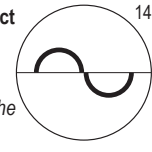
**Correct setting! (14)**

Two semicircles appear exactly in the middle of the eyepiece.

**5.7.4 Incorrect pressure****The outside borders of the fluorescein bands are in contact with each other (15)**

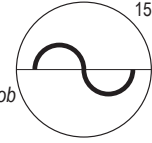
Not enough pressure.

➔ Increase the pressure slightly by rotating the knob on the tonometer.

**Fluorescein bands are superimposed to form a band (16)**


Pressure slightly too low.

➔ Increase the pressure slightly more by rotating the knob on the tonometer.



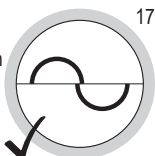
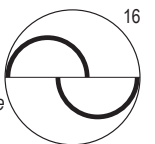
Bands are no longer in contact (17)

Pressure is too high.

 Lower the pressure by rotating the tonometer knob in the opposite direction.

Correct setting! (18)

The inside borders of the fluorescein bands are contacting each other.



6. Technical data

6.1 Aplation tonometer AT 900

Measuring force generated through leverage weight.

Installation

AT 900 model R

Can be fitted on the peg on the microscope.

AT 900 model T

Can be fitted on the guide plate on the swivelling peg for the microscope and illumination arm.

Measurement range

AT 900 model BQ

Assembly on the microscope arm.

Measurement deviation

The measurement deviation in the measuring prism is in the measuring range from 0 – 58.84 mN and amounts to a maximum of $\pm 1.5\%$ and to a minimum of ± 0.49 mN of the nominal value.

Backlash width

≤ 0.49 mN

Net weight

AT 900 model R

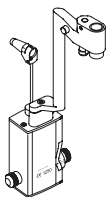
0.750 kg (without accessories)

AT 900 model T

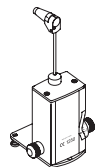
0.610 kg (without accessories)

AT 900 model BQ

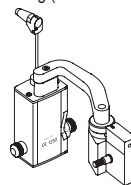
0.880 kg (without accessories)



AT 900 model R



AT 900 model T



AT 900 model BQ

6.2 Aplation tonometer AT 870

Measuring force generated

Via spring force

Installation

On / over the microscope

Measurement range

0 – 80 mm Hg

Measurement deviation

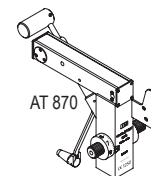
See above model AT 900

Backlash width

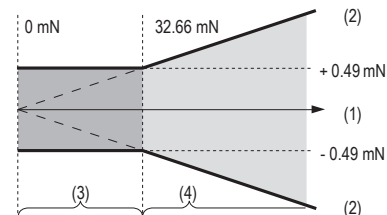
≤ 0.49 mN

Net weight

0.850 kg (without accessories)



- Nominal value
- Maximum limiting deviation
- Limiting deviation of 0 to 32.66 mN: Maximum = 0.49 mN
- Limiting deviation from 32.67 mN: Maximum = 1.5% of nominal value



7. Maintenance

**WARNING!**

Installation, repairs and modifications may only be performed by trained specialists.

7.1 Repairs

To ensure a long service life, the device must be cleaned every week as described and covered with a dust cover when not in use. We recommend having the device checked annually by an authorised service technician.

7.2 Cleaning

- Clean the housing with a dry cloth.
- Do not use any liquids, corrosive substances or alcohol.

7.3 Checking the Tonometer AT 900



NOTE!

This check must be carried out once a month. If the check yields erroneous results, please check the following points:

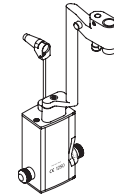
1. Is the measuring prism properly positioned?
2. Is the control weight correctly set?
3. Repeat the check.

Defective equipment must be sent immediately to your HAAG-STREIT representative.

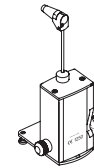


NOTE!

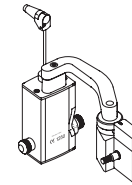
HAAG-STREIT offers a repair and service package. For further information, please contact your HAAG-STREIT representative directly.



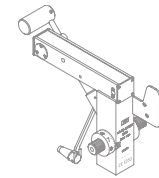
AT 900 model R



AT 900 model T



AT 900 model BQ



AT 870

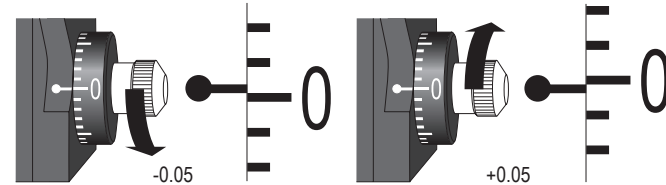
Check the drum position 0

- Check position -0.05

The zero line on the measuring drum is moved downwards, opposite the index, by a single marking width. The feeler arm must move by itself all the way to the stop-piece, in the direction of the examiner.

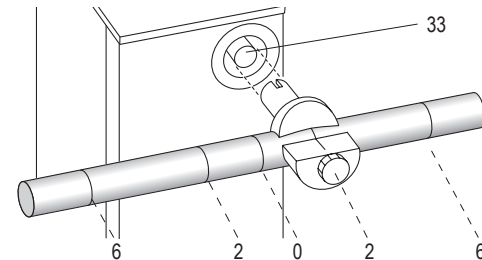
- Check position +0.05

The zero line on the measuring drum is moved upwards, opposite the index. The feeler arm must move all the way to the stop-piece, on the patient's side.



Check the drum position 2

- To conduct it, a control weight is used. The weight rod is engraved with five rings. The middle ring corresponds to a scale value of 0, the rings immediately to its left and right correspond to a value of 2, and both outside scale rings have a value of 6.
- One of the drum setting marks is set exactly to the index line on the holder. The weight is fitted on the feeler axis (33) so that the longer part points to the examiner.

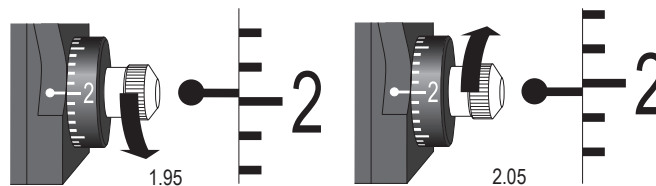


- Check position 1.95

With a drum position of 1.95, the feeler arm must move from the free-movement area toward the limit stop in the direction of the examiner.

- Check position 2.05

With a drum position of 2.05, the feeler arm must move from the free-movement area toward the limit stop in the direction of the patient.



Check the drum position 6

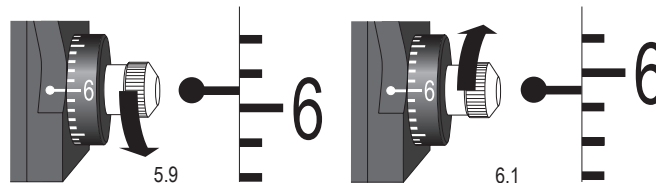
Set the weight rod to 6 on the scale, the longer part points to the examiner.

- Check position 5.9

The check point is at 5.9. Move the measuring drum's calibration mark 6 downwards, opposite the index, by a $\frac{1}{2}$ interval. The feeler arm must move towards the examiner.

- Check position 6.1

The check point is at 6.1. Move the measuring drum's calibration mark 6 upwards, opposite the index, by a $\frac{1}{2}$ interval. The feeler arm must move towards the patient.



7.4 Checking the Tonometer AT 870



NOTE!

This check must be carried out once a month. If the check yields erroneous results, please check the following points:

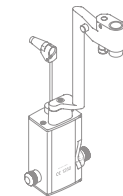
1. Is the measuring prism properly positioned?
2. Is the control weight correctly set?
3. Repeat the check.

Defective equipment must be sent immediately to your HAAG-STREIT representative.

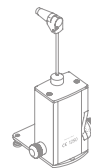


NOTE!

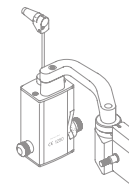
HAAG-STREIT offers a repair and service package. For further information, please contact your HAAG-STREIT representative directly.



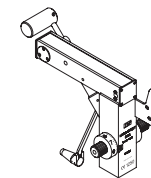
AT 900 model R



AT 900 model T



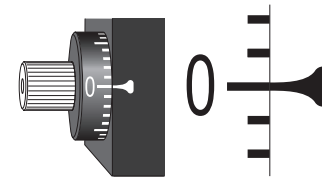
AT 900 model BQ



AT 870

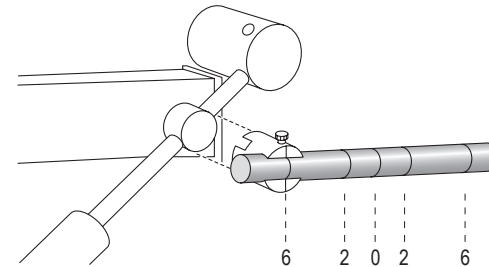
Check the drum position 0

In working position, the feeler arm is swivelled and the measuring drum is set to 0. The arm carrying the measuring prism must swing freely between the limit stops on contact.



Check the drum position 2

- The control weight is to be used for this inspection. The weight rod is engraved with five rings. The middle ring corresponds to a scale value of 0, the rings immediately to its left and right correspond to a value of 2, and both outside scale rings have a value of 6.
- A mark corresponding to the measuring drum setting 2 is set exactly to the index mark on the weight holder, whereupon the weight is fitted on the tonometer axis so that the longer part points in the direction of the patient. The feeler arm must move towards the patient.

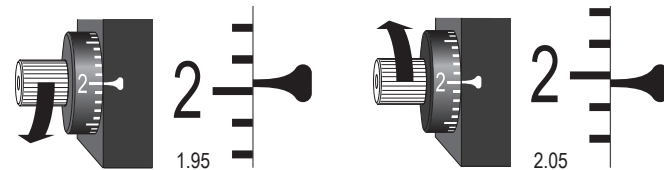


- Check position 1.95

Move calibration mark 2 on the measuring drum downwards, opposite the fixed index, by a width of one marking. With light pressure to the feeler arm in the direction of free movement, the feeler arm must start to move independently towards the limit stop in the direction of the examiner.

- Check position 2.05

Move calibration mark 2 on the measuring drum upwards, opposite the fixed index, by a width of one marking. The feeler arm must start to move into direction of the stop-piece on the patient's side.



Check the drum position 6

Set the weight rod to 6 on the scale, the longer part points to the patient.

- Check position 5.9

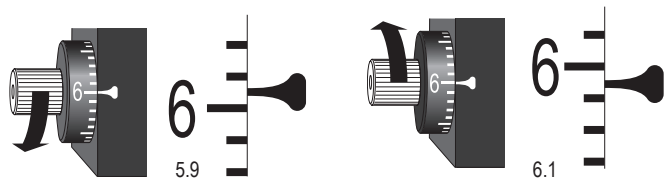
The check point is at 5.9. Move the measuring drum's calibration mark 6 downwards, opposite the index, by a ½ interval.

The feeler arm should move towards the examiner.

- Check position 6.1

The check point is at 6.1. Move the measuring drum's calibration mark 6 upwards, opposite the index, by a ½ interval.

The feeler arm should move towards the patient.

**A. Appendix****NOTE!**

Order numbers *are written in italics*.

An asterisk (*) shows that you should contact your HAAG-STREIT representative for further information.

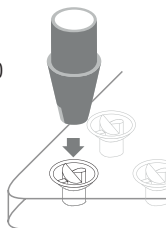
A.1 Accessories – Original HAAG-STREIT measuring prisms

The original HAAG-STREIT measuring prisms are made of PMMA and guarantee the best optical and mechanical quality. Reusable measuring prisms must be cleaned and disinfected after every examination. See chapter 2 in the separate instructions for use "Cleaning and disinfection", *HS item no. 7220315*

**A.2 Accessories – Tonosafe**

Tonosafe disposable prisms are a comfortable and effective solution to reduce the risk of cross-infection in patients. Tonosafe is available in sterile packages with 5 supports and 100 disposable prisms.

HS item no. 7220345

**B. Legal regulations**

- HAAG-STREIT maintains a quality management system in accordance with EN ISO 13485.
- The AT 900 tonometer is a Class I device with measuring function in accordance with Appendix IX of Directive 93/42/EEC. By affixing the CE mark we confirm that our device complies with the applicable standards and directives.
- You can request a copy of the declaration of conformity for the appliance from HAAG-STREIT at any time.

C. Classification

CE Directive 93/42/EEC

Class Im (measuring function)

FDA

Class II

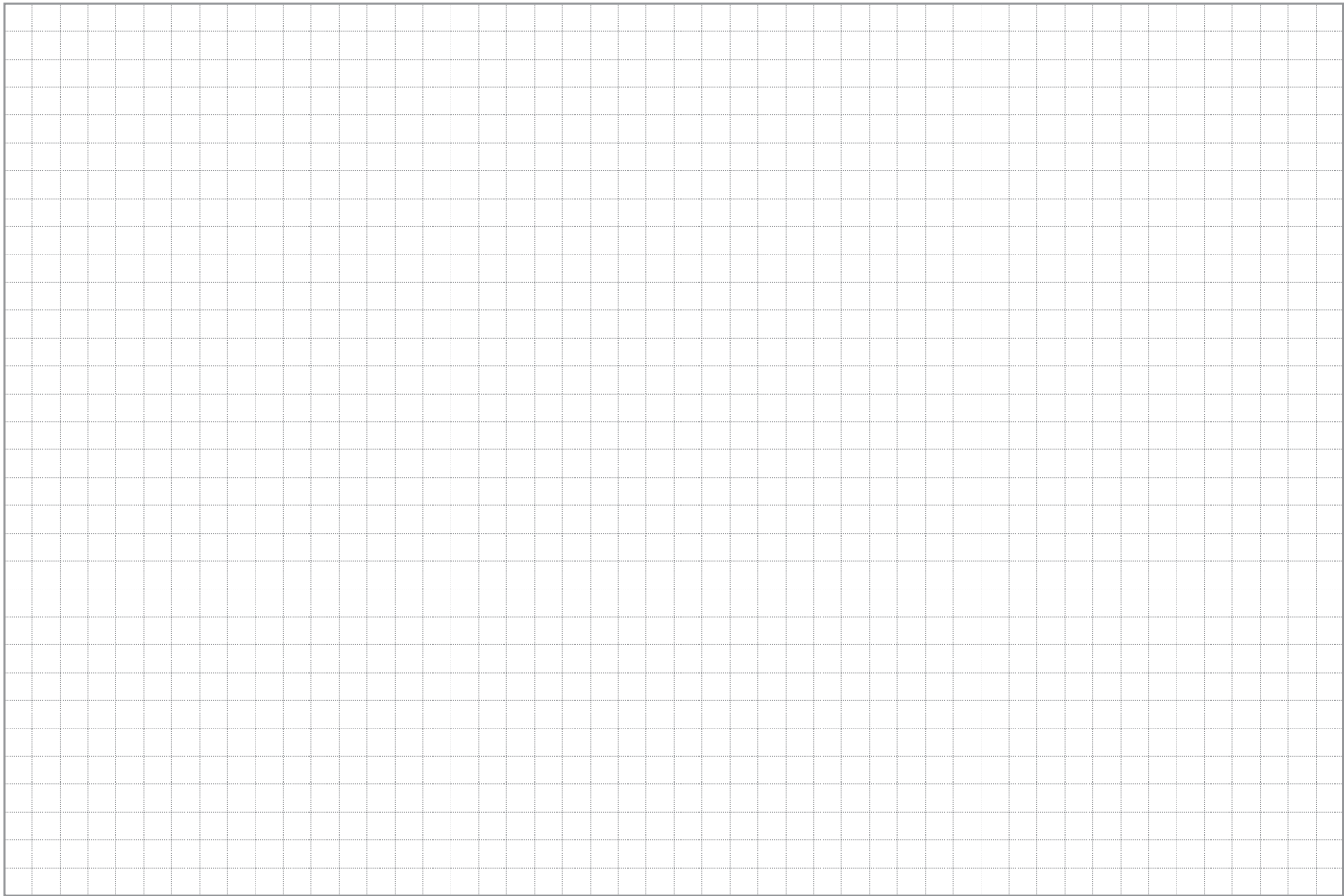
D. Disposal

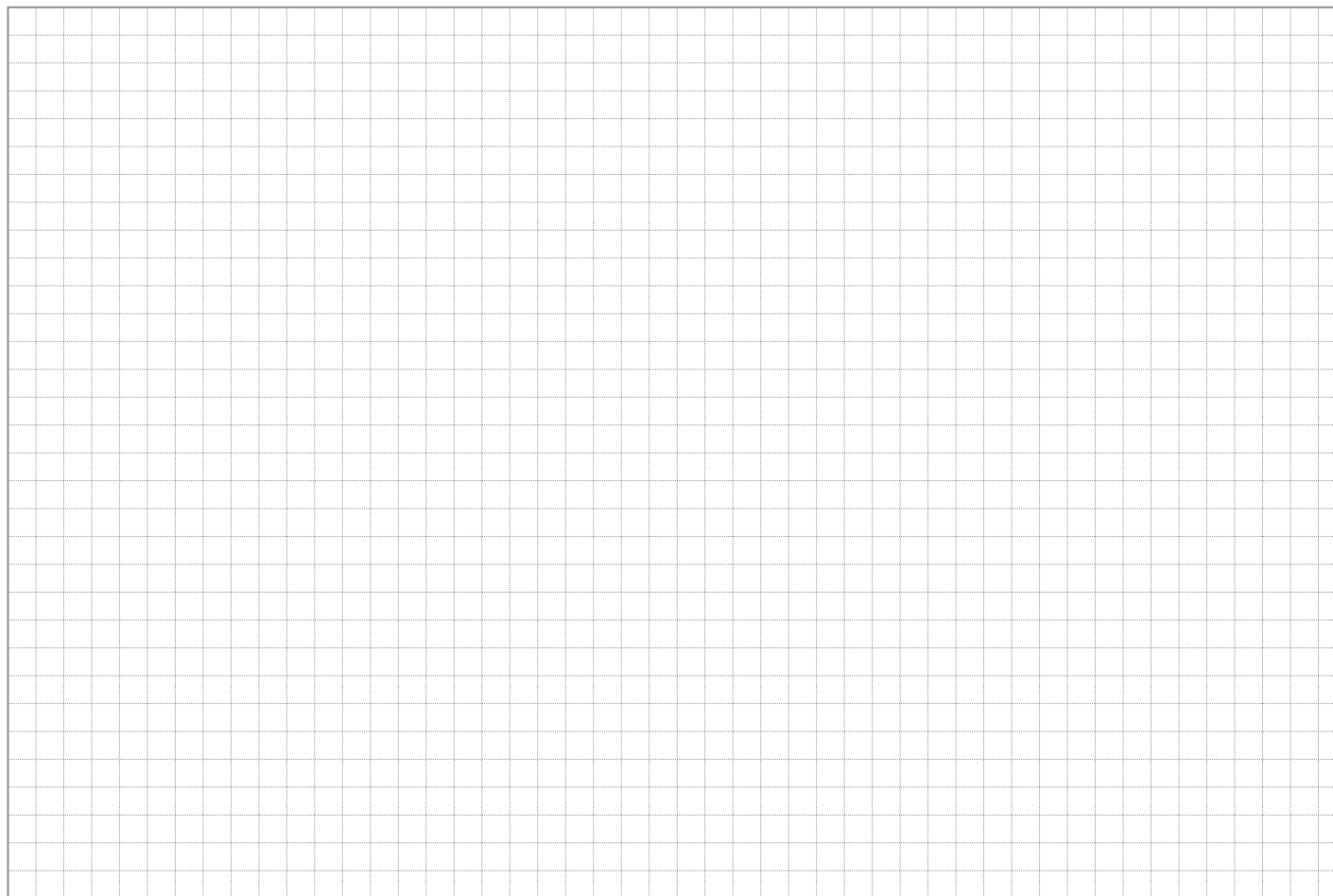
For correct disposal, please contact your HAAG-STREIT representative. This will guarantee that no hazardous substances enter the environment and that valuable raw materials are recycled.

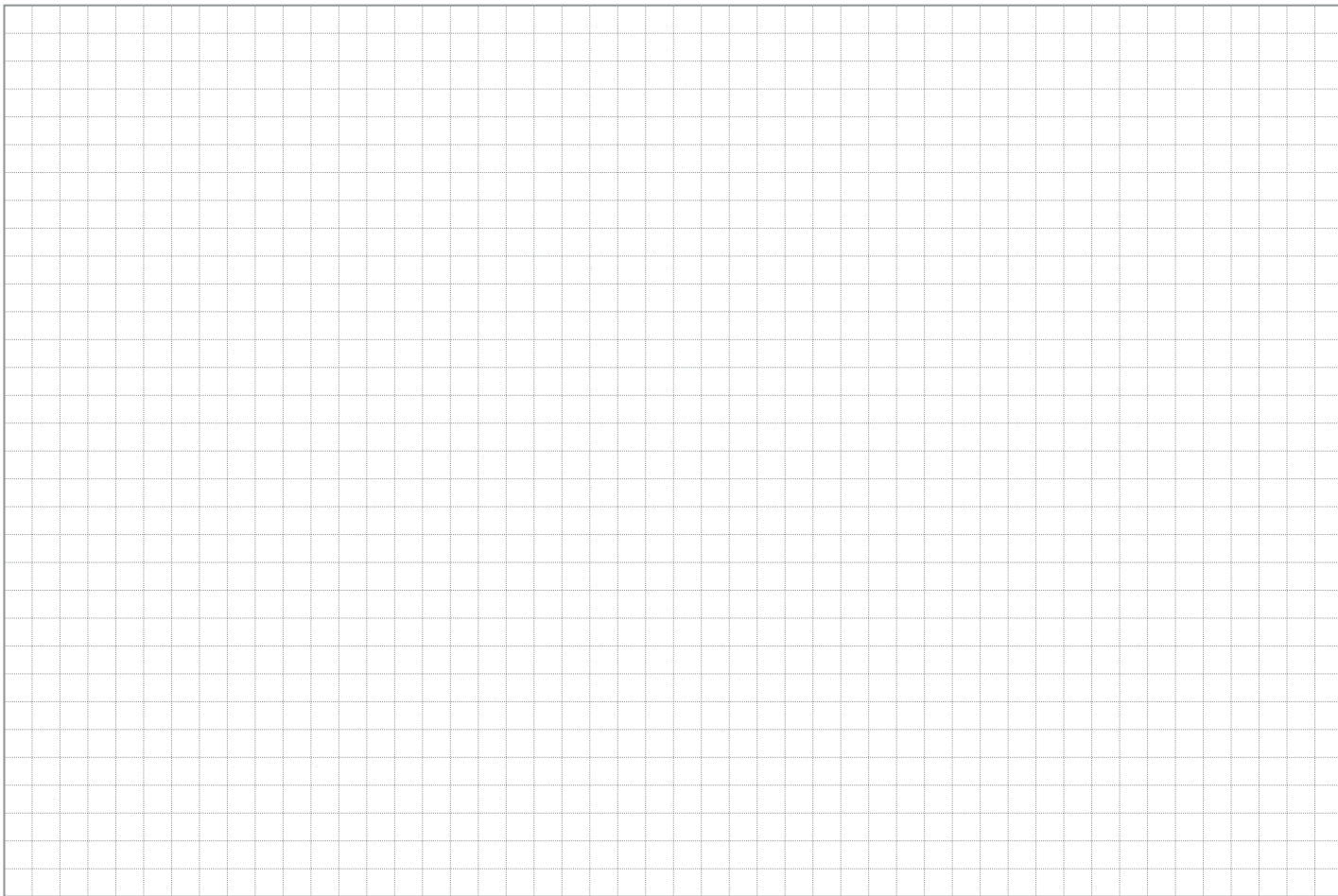
**E. Standards**

EN ISO 8612

EN ISO 15004-1







Should you have any further questions, please contact your HAAG-STREIT representative at:
<http://www.haag-streit.com/contact/contact-your-distributor.html>

**HS HAAG-STREIT
DIAGNOSTICS**

Certified Quality Management System



EN ISO 13485
Reg. Nr. 11956



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