Inami & Co., Ltd.

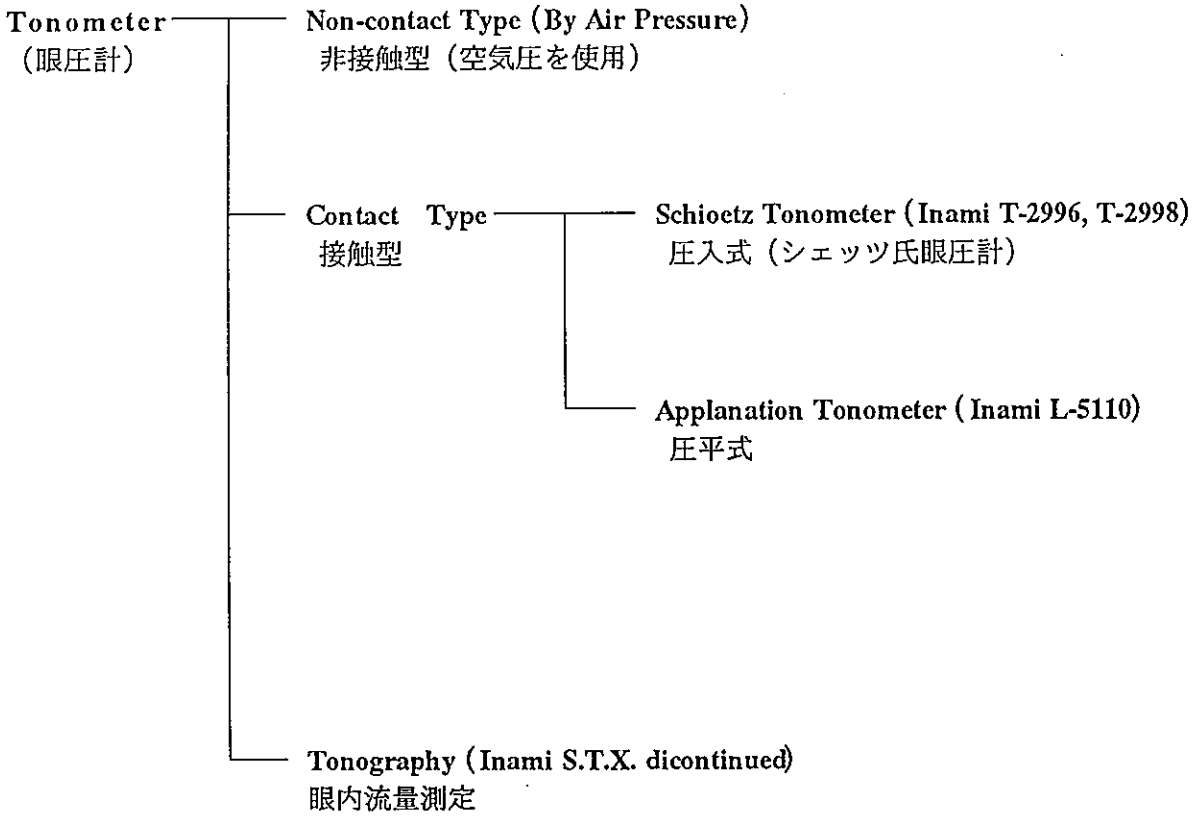
TÜV CERT DIN EN ISO 9001, EN 46001, ISO 13485
Certificate: 09 105 89060

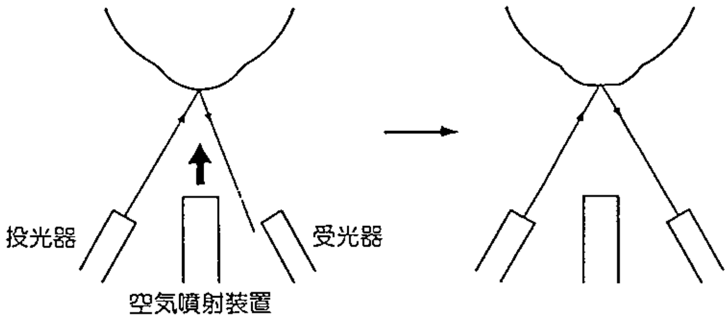
Text for the Maintenance

Inami Ophthalmic Instruments

Applanation Tonometer

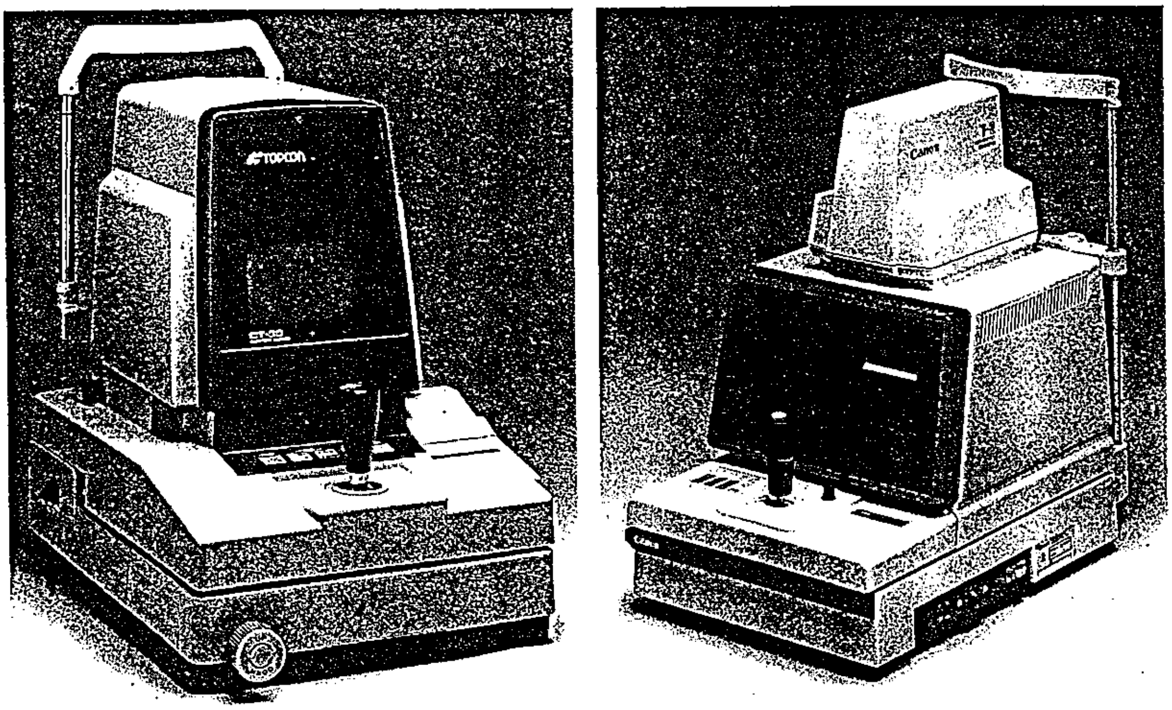
L－５１１０ Applanation Tonometer
（アプラネーショントノメーター）





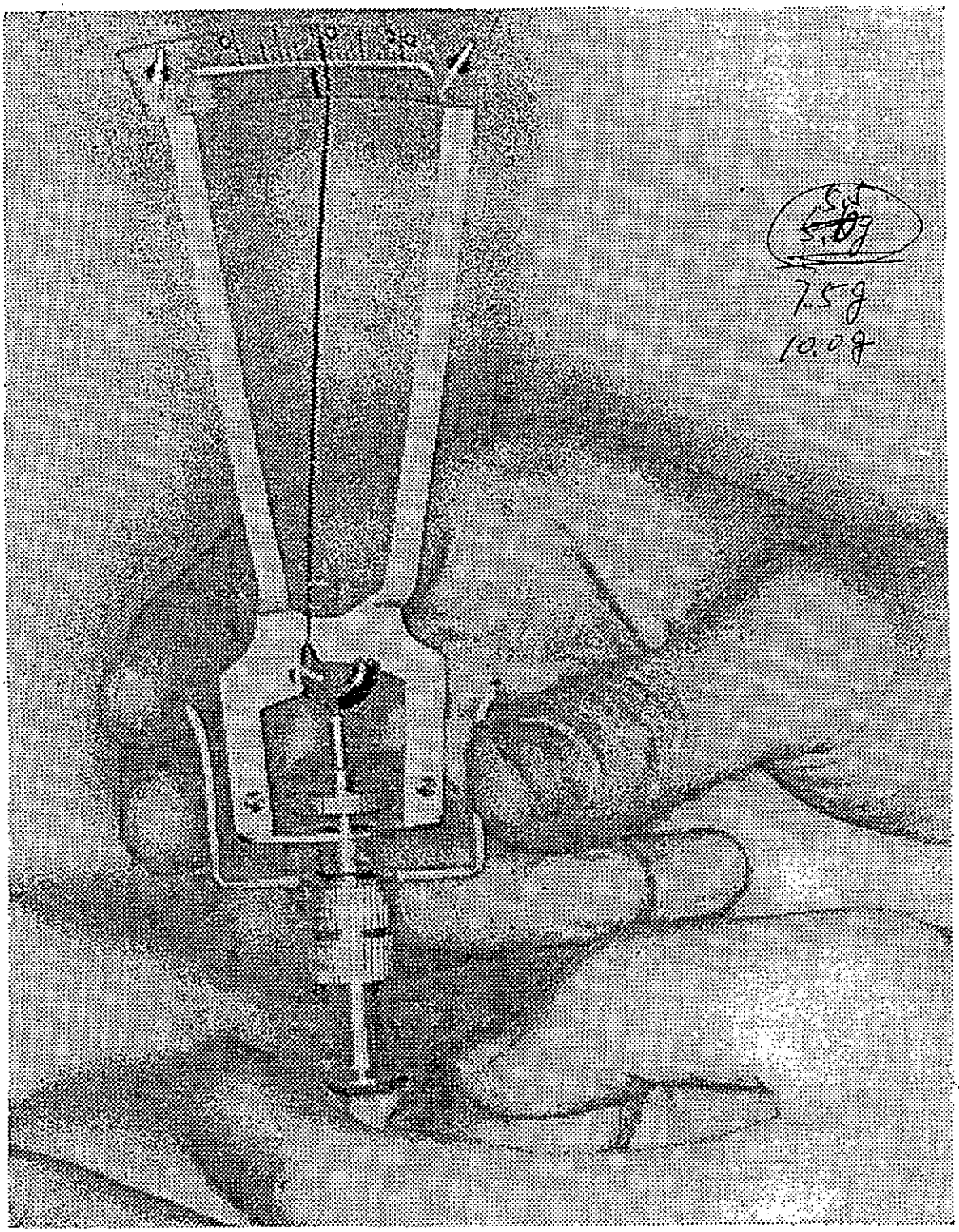
NCT のシエーマ

角膜が圧平された時受光器に入る光量が最大となる.

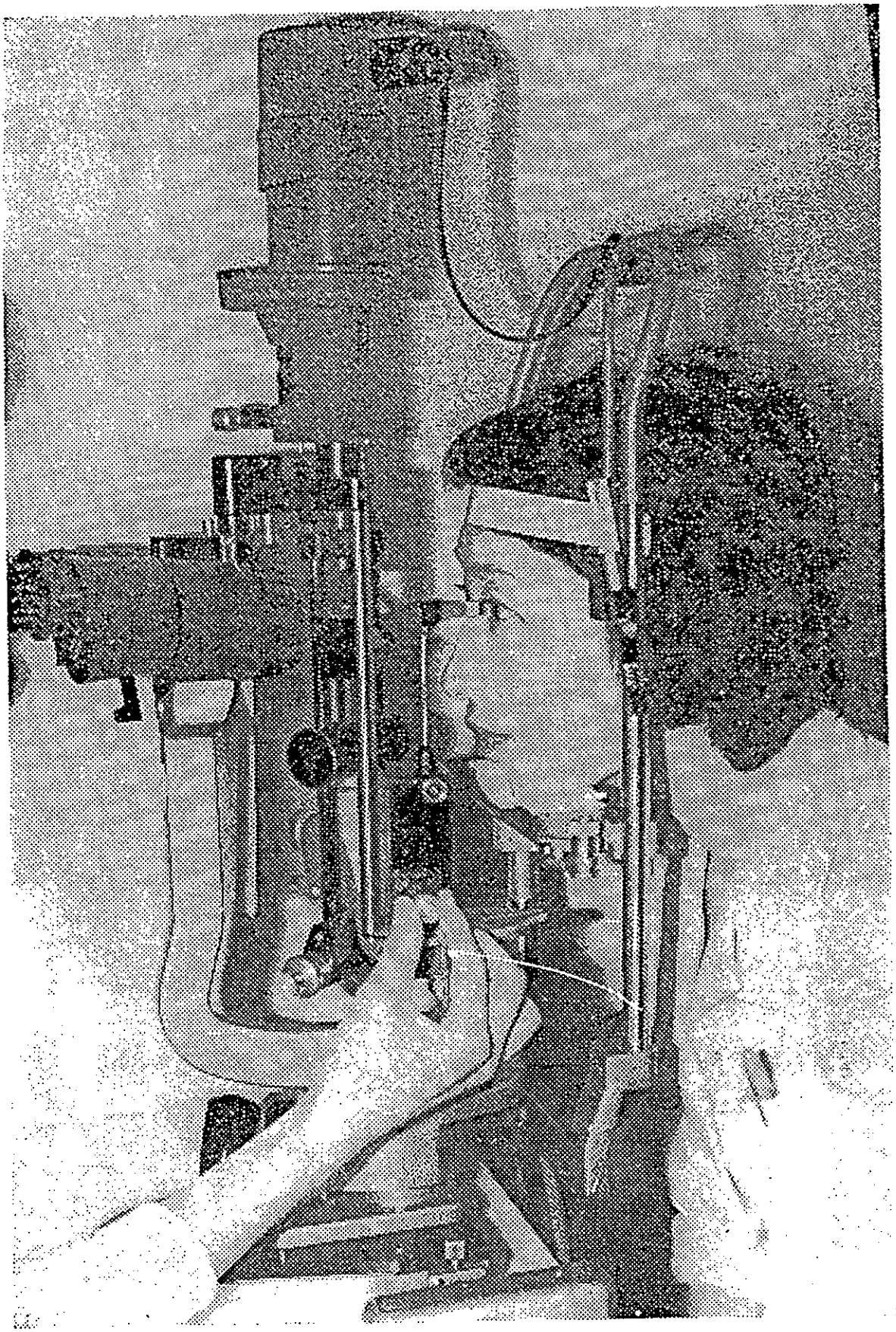


NCT 装置

CANON
測定方法について
レポート



シエッツ型圧入眼圧計（Sklar）による眼圧測定



ゴールドマン型平眼圧計による眼圧測定

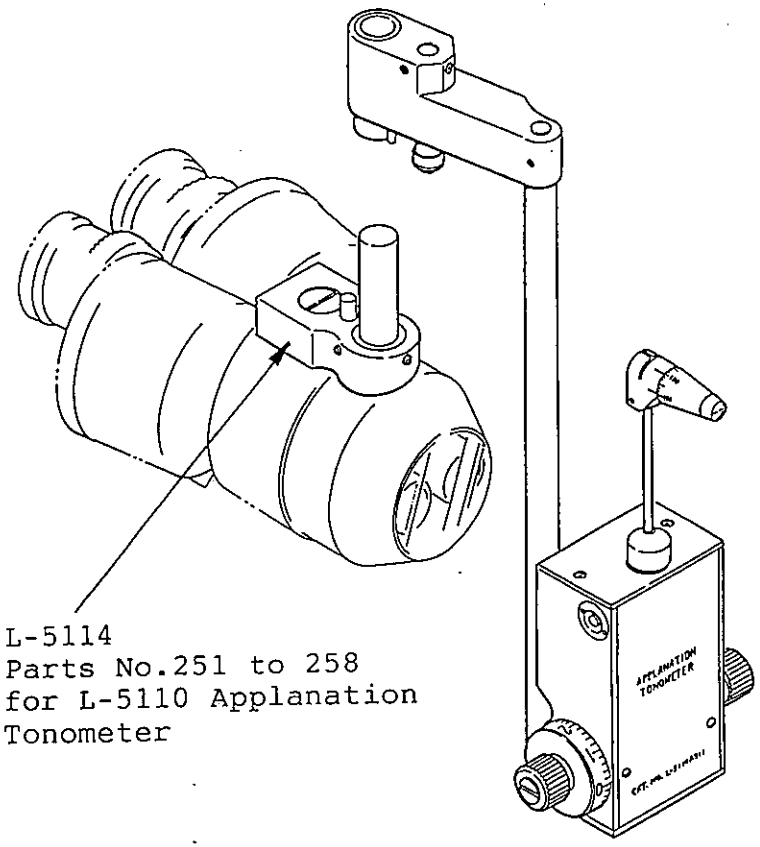
2．スリットランプへの取り付け方
How to equip to the slit lamp

アプラネーショントノメーターには吊り下げるタイプ（Ｌ－５１１０）と置くタイプ（Ｌ－５１３０）の２種類があります。（別紙参照）
There two ways how to equip the applanation tonometer to slit lamp, one way is hanging type(L-5110 and another way is placing type(L-5130) . (Refer to the attached sheets)

一般的には、Ｈａａｇ－Ｓｔｒａｉｔタイプのスリットランプには吊り下げるタイプが使われています。吊り下げるタイプは使用しない時には横に振れるため、いちいち取り外さなくても済むからです。
Normally, hanging type is preferred to equip Haag-Strait type slit lamp because it can be swang during unuse without taking out.

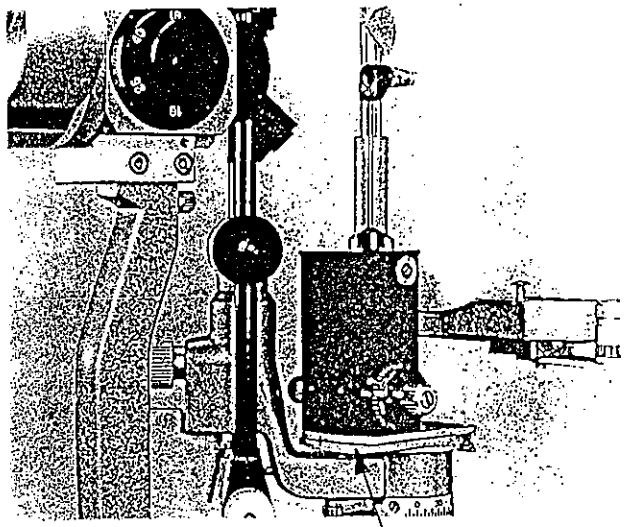
How to equip to Slit Lamp

L-5110

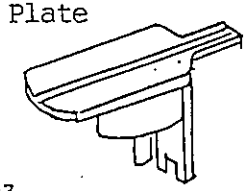


L-5114
Parts No.251 to 258
for L-5110 Applanation
Tonometer

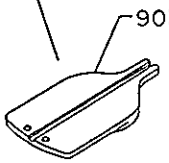
L-5130



L-0399-3600
Tonometer Mounting
Plate



(For Compact
Slit Lamp)



L-0210-903 (For Haag-Strait Type)
Parts No. 903 Guide Plate for
Hruby Lens and applanation
Tonometer L-5130 for Slit Lamp

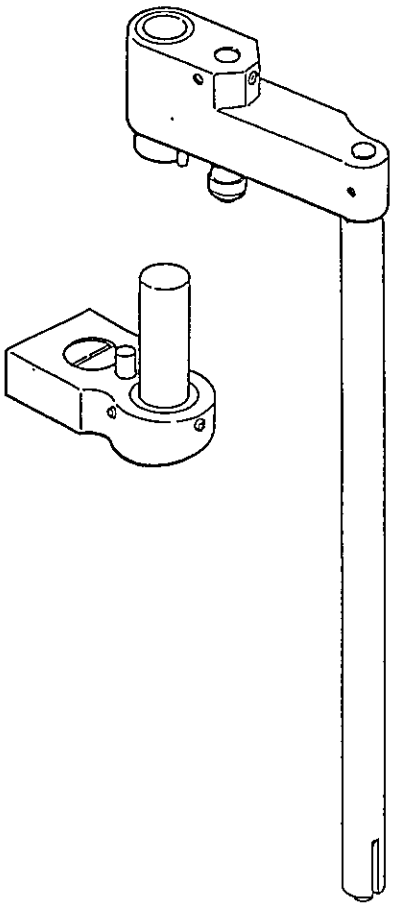
3．仕様、セットの内容
Specifications and Inami's Applanation Tonometer Set

イナミアプラネーショントノメーターＬ－５１１０の仕様、セットの内容は次の通りです。
The specifications of Inami applanation tonometer is as follows.
And also Inami's applanation tonometer consists of the main body of applanation tonometer, two pieces of cone prism, calibration bar and mount for tonometer.

INAMI APPLANATION TONOMETER

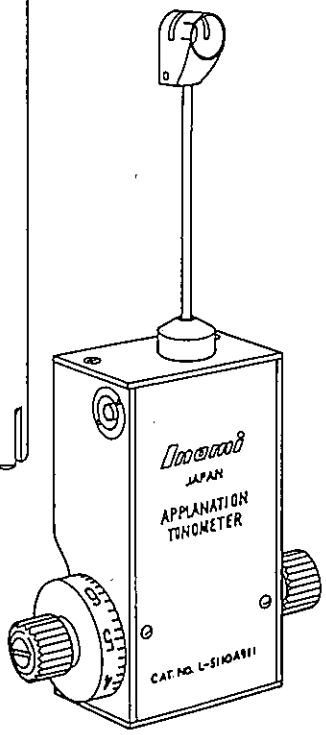
Standard Set

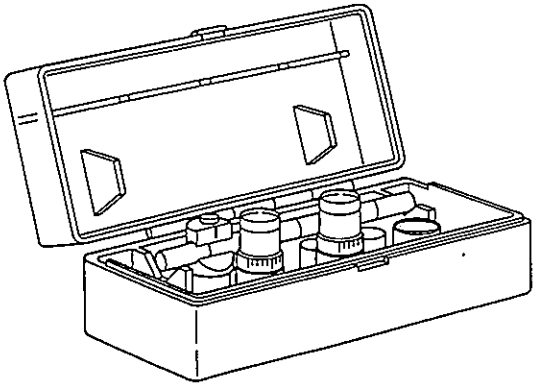
Applanation tonometer·····1
Prism·····2
Calibration bar·····1
Mount for tonometer·····1



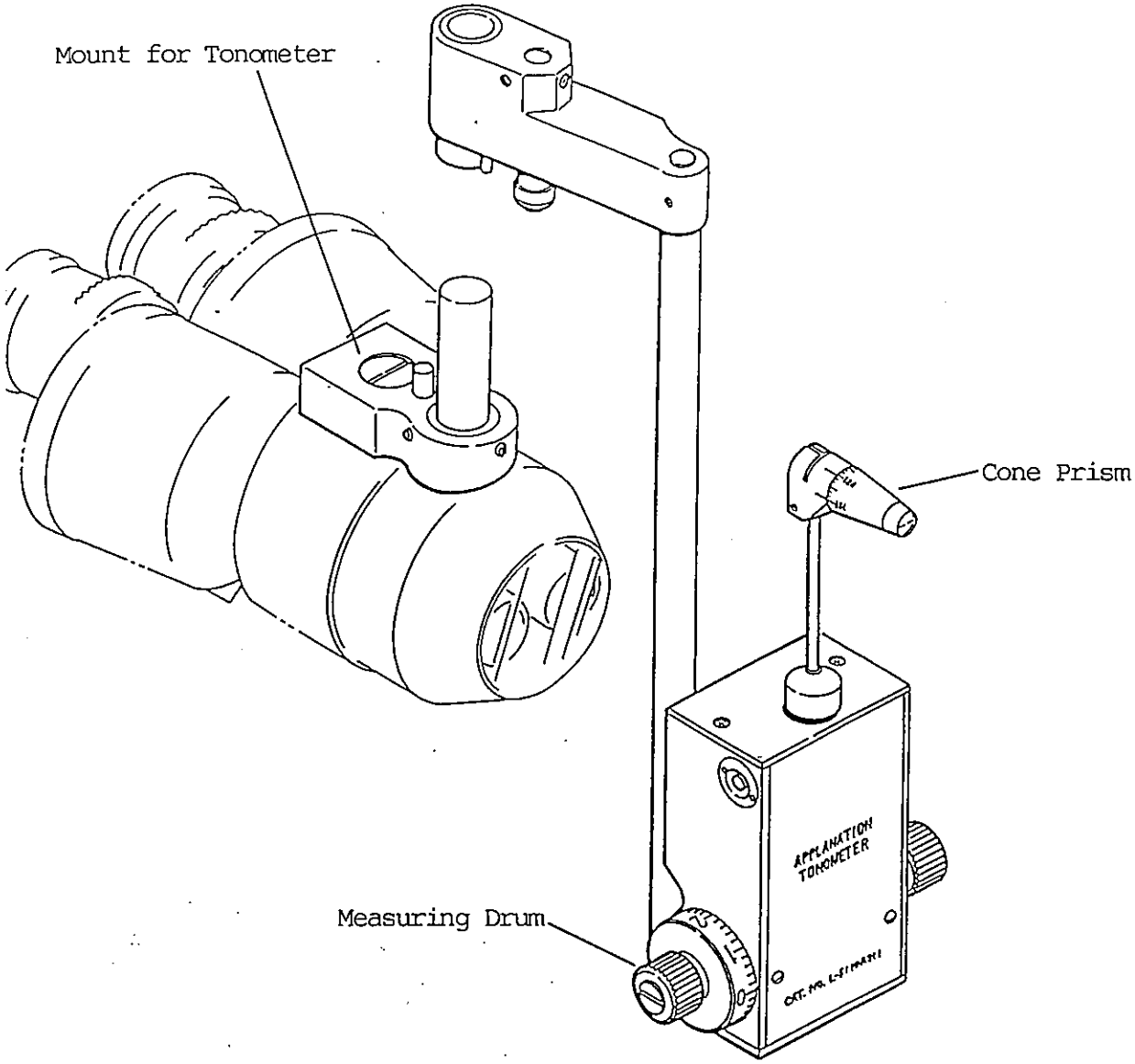
Specifications:

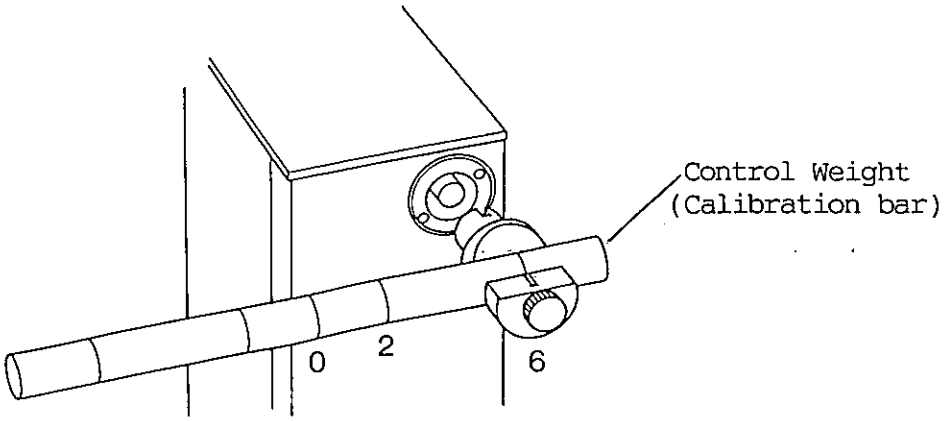
Measuring range: From 0 to 80mmHg in 2mmHg increments
±0.5mmHg
Diameter of the pneumatic face: 3.06mm
Measurement: 47mm wide × 30mm deep × 85mm high
Weight: 725gs.





NAMES OF RESPECTICE PARTS





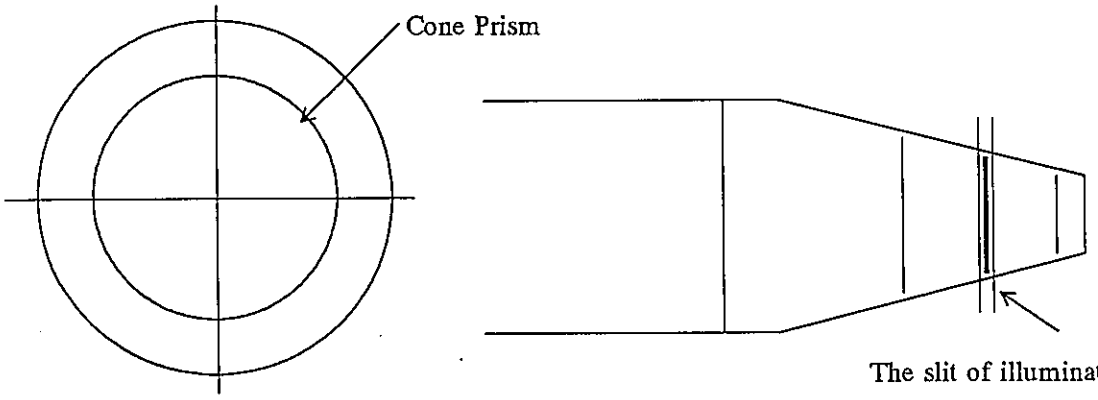
4 . Checking items when applanation tonometer is equipped to slit lamp at first time after purchasing.

(1) Cone prism position

Usually cone prism position is not miss-aligned.
But it is required to re-adjust the cone prism position due to the following reasons.
* The slightly differences of dimension among slit lamps
* The slightly differences of dimension among the mounting parts of applanation tonometer
* Miss aligned by the vibration during transportation
* The different manufacturer of slit lamp

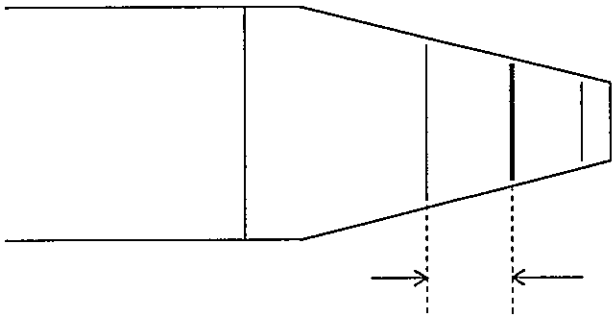
When the measuring dram is set at "0", check cone prism position.

① The cone prism is located at the center of the view through the eyepiece.
And the slit of illumination is on the black line of cone prism.



The slit of illumination is on the black line of cone prism.

② When the measuring drum is turned toward plus and minus, the slit of illumination is irrediated within the following range.

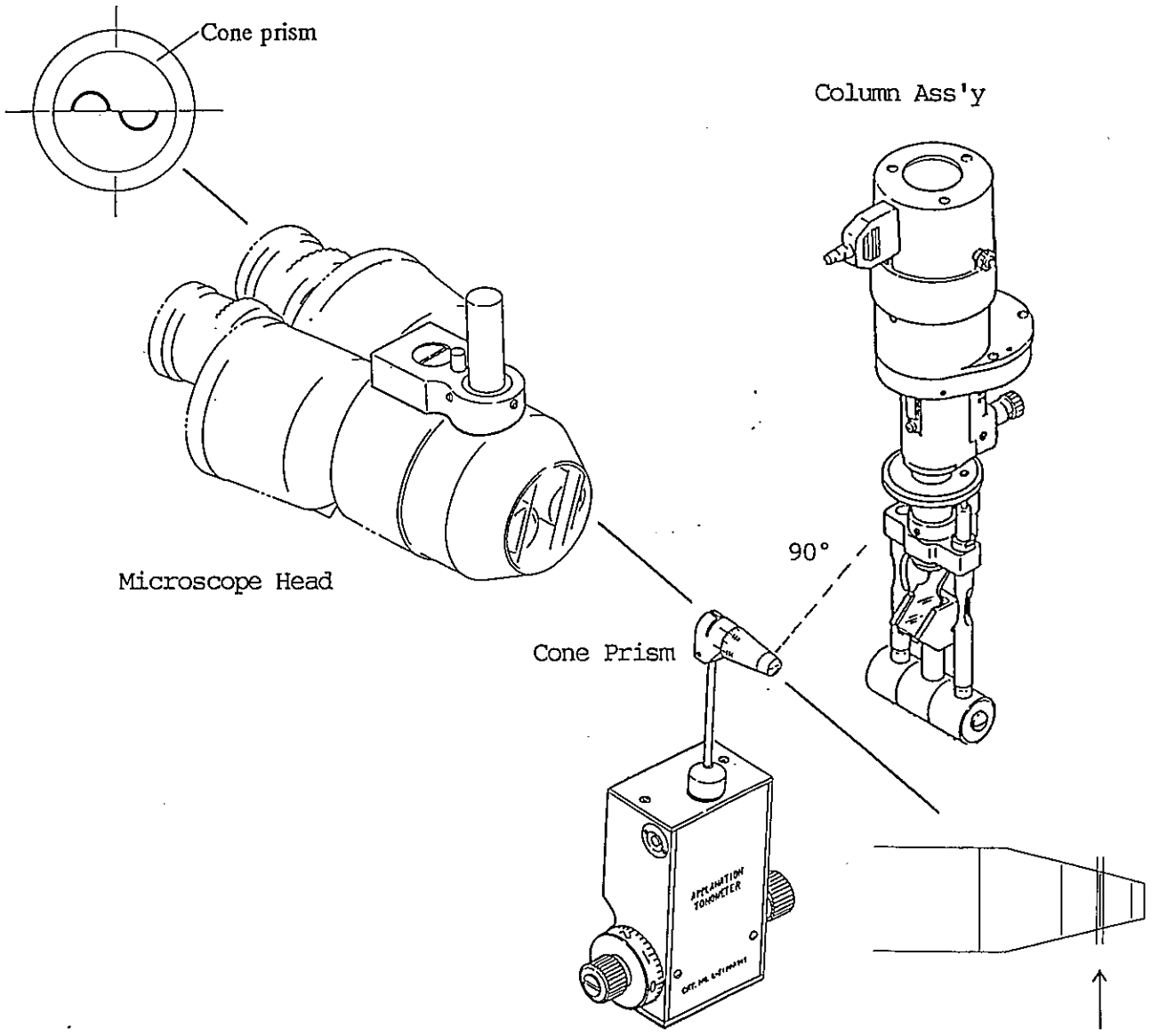


The slit of illumination must be irradiated within this range.

(2) Check of applanation tonometer

Check the applanation tonometer at 0, 2gr and 6gr positions.

Check for Prism Position

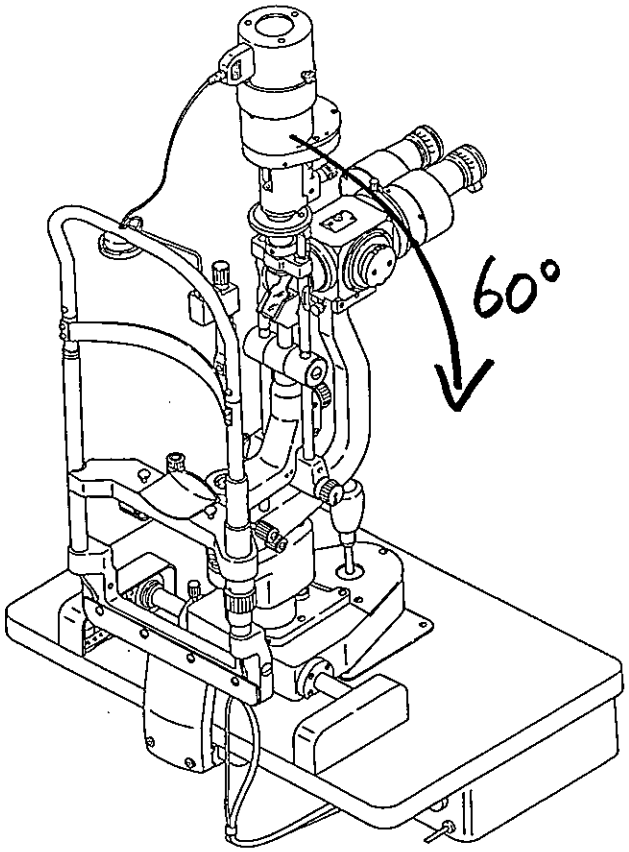


The slit illumination must be on the black line when the measuring drum is at 0.

5 . Operation procedure (See page 3 and 4 of operation manual for details).

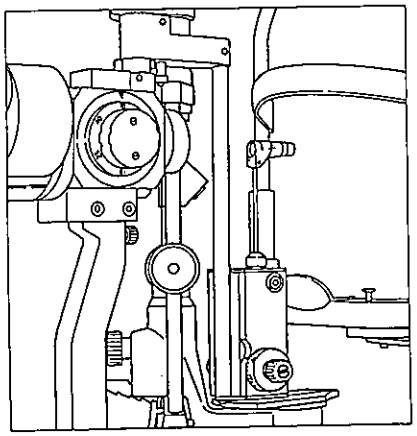
① Administer the topical anesthesia(eye drop) to the patient. Then put fluorescein to the eye for dyeing.

② Adjust the eyepiece focus of slit lamp. Then swing the column assembly at 60 .



③ Set the applanation tonometer at the front of slit lamp.

④ Choose cobalt filter and open the silt illumination fully.



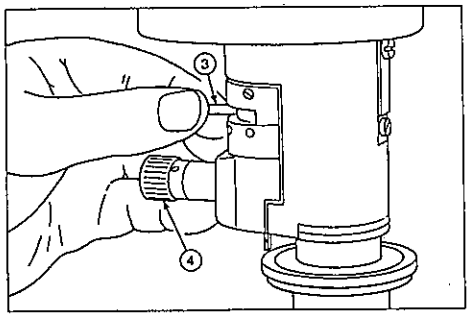
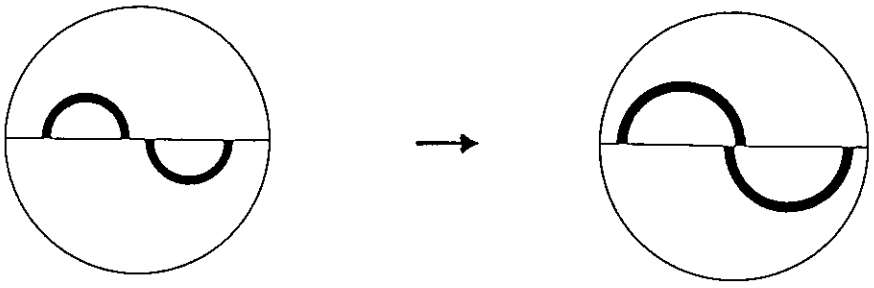


Fig. 23 Illumination System Controls
3. Filter Disc Lever
4. Aperture Disc Control Knob

⑤ Measure with observing through left epepiece.(See page 5 and 6 of operation manual for details.

Because the cone prism is located on the optical axis of left eyepiece, cone prism can be ssen through left eyepiece only.



Read the scale of measuring drum when the inner borders of two fluorescein rings are met in approx. 0.3mm line width.

Scale of Measureing Drum × 10= mmHg

6. Check of Cone Prism Position

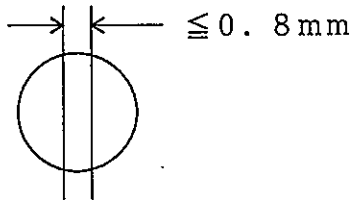
(1)Adjust the epepiece focus of slit lamp.

(2)Swing the column assembly of slit lamp at 90° .

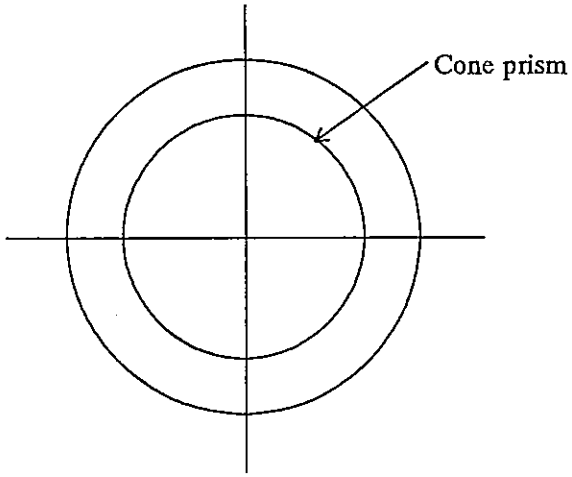
Note: Column assemble is set at 90° during the maintenance.
(Both sides are available.)

	Column Assembly Position
Doctor use	60°
Maintenance	90°

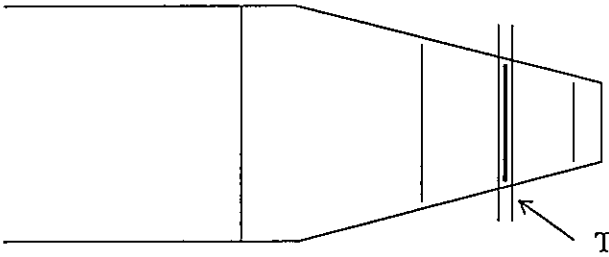
(3)Adjust the slit width of illumination less than 0.8mm as narrow as possible.



(4)See the cone prism through left eyepiece and check whether cone prism is located at center.
If cone prism is not at the center, adjust the cone prism position of vertical and horizontal direction.

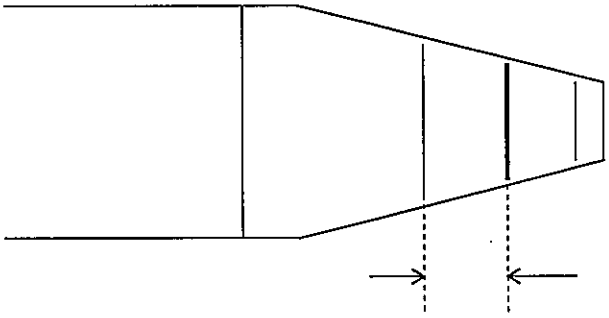


(5)Irradiate the slit illumination to the cone prism and check whether it is on the black line of cone prism when the measuring drum is set at 0 scale.
If the slit illumination is not on the black line, adjust the cone prism postion.



The slit illumination must be on the black line when the measuring drum is at 0.

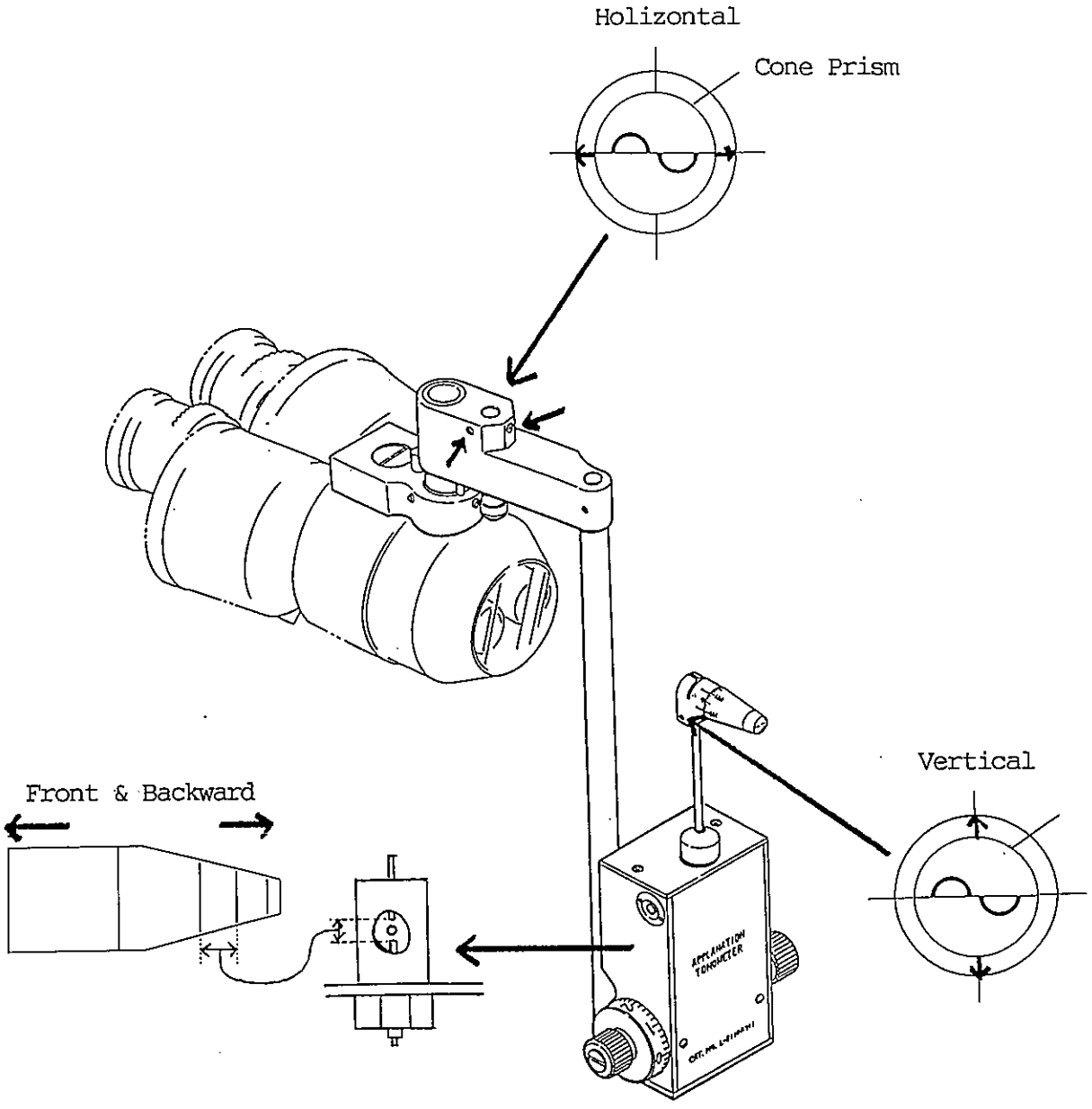
(6)Turn the measuring drum toward plus and minus and check whether the slit illumination is irradiated within the range below.



The slit illumination is irradiated within this range.

If the slit illumination is not irradiated within the abvove range, adjust the cone prism position front and backward.

Position to be adjusted the Cone Prism



8 . Maintenance

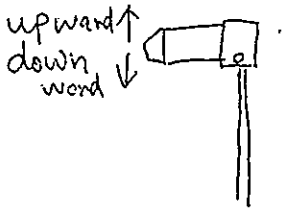
(1) Adjustment of cone Prism Position (Vertical)

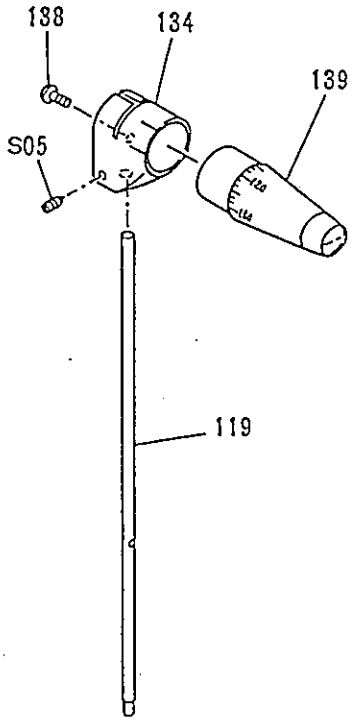
Adjustment of the prism out of center of the viewer

It the illumination is out of the center of the viewer, please procedure following adjustment.

Release screw S05 of 134 for 2pcs and move the position of prism. Also this check should be through eyepieces with 10X and re-check at 16X for cross check only.

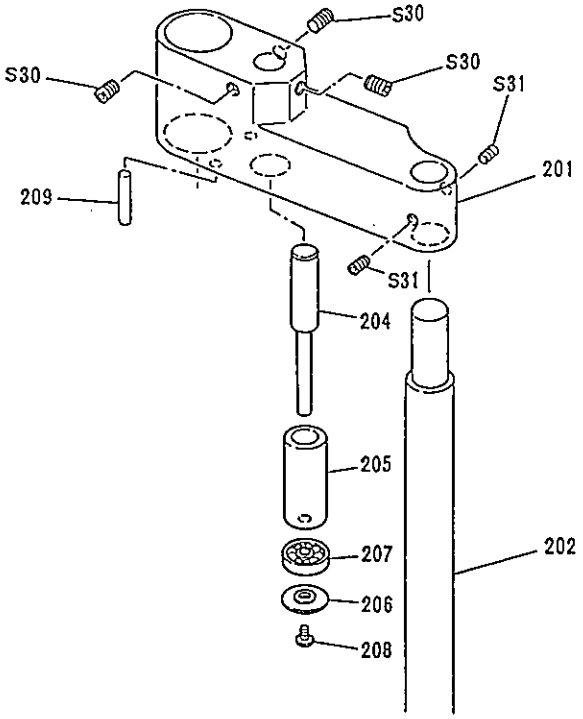
However, if you can not get the center position, you release and move the parts No.S30 and change the tonometer location.





(2) Adjustment of Cone Prism Position(Holizontal)

Adjust by 3 pcs of screw (#S30) .



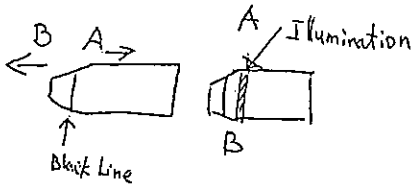
(3) Adjustment of Cone Prism Position (front and backward)

Upper screw : Prism inclines doctor side.
Lower screw : Prism inclines patient side.

Adjustment of the prism location

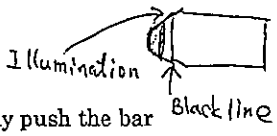
If you move the illumination coloum at 90 degrees and with narrow slit Illumination and check the illumination is on the black line. If not, please procedure following adjustment.

Illumination is in the position of A side.

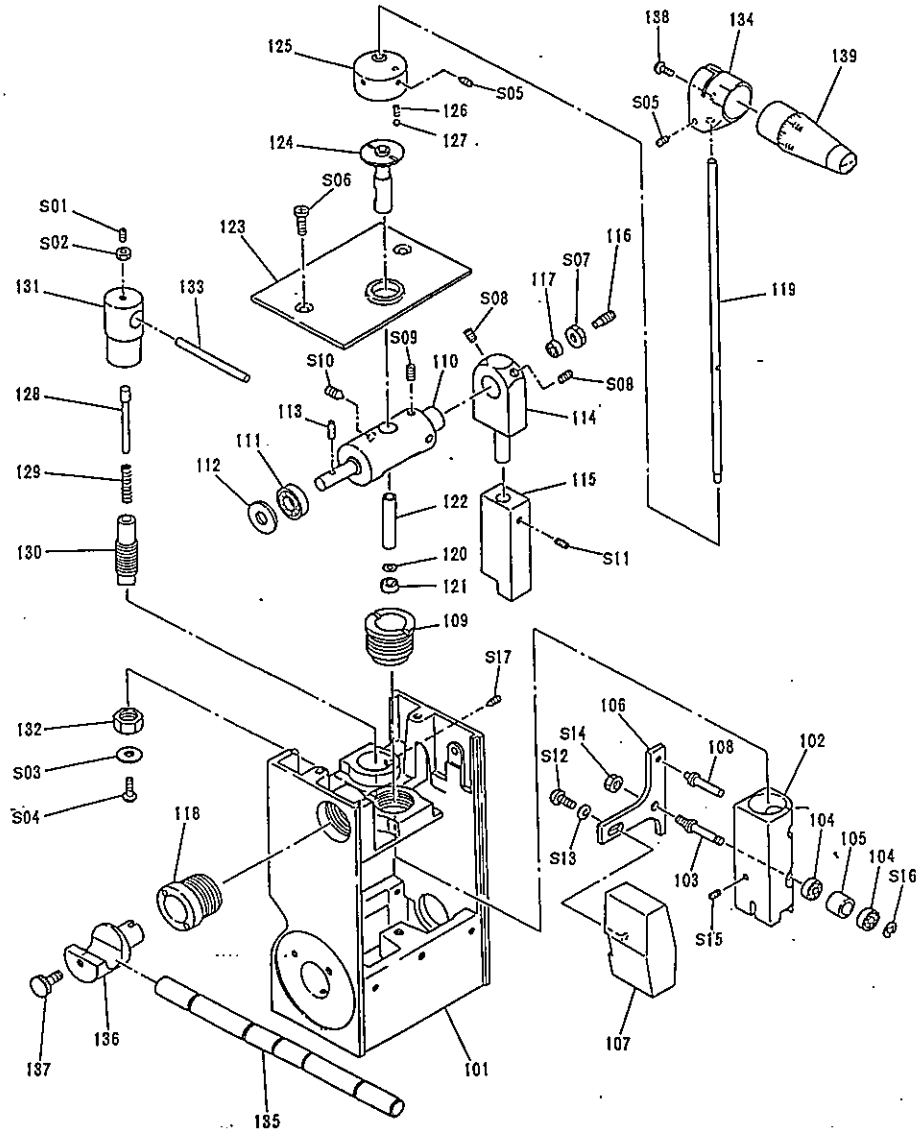


Open the cover and release S02 and move S01.

Illumination is in the position of B side



Open the over and release 132 and move S04. Also you should be lightly push the bar No.119 for doctor side when you are doing this adjustment.



IX CHECKING THE INSTRUMENT

a) Checking at drum position 0 (zero)

Insert the measuring prism.

Measuring position −0.05:
The zero mark on the measuring drum is set one line width below the index (fig. 16).
When the pressure arm – with prism in position – is gently pushed it should move freely between the two stops and return towards the stop on the examiner's side.

Measuring Position +0.05:
The zero mark on the measuring drum is set one line width above the index (fig. 16). When following the same procedure as above the pressure arm should move towards the patient's side.

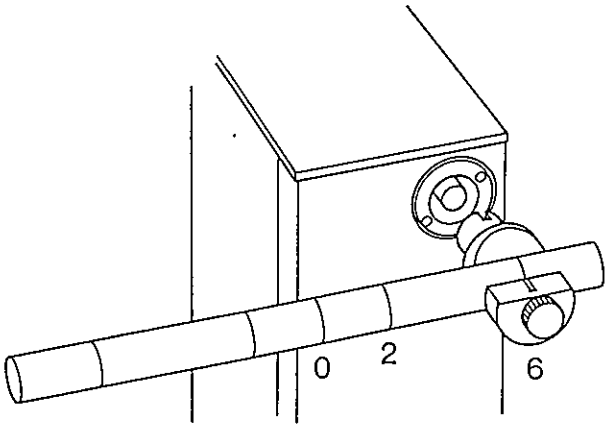


Fig. 15

b) Checking at drum position 2

For this check the control weight is used (Fig. 15). Five circles are engraved on the weight bar. The middle one corresponds to drum position 0, the two immediately to the left and right to position 2 and the outer ones to position 6.

One of the marks on the weight corresponding to drum position 2 is set precisely on the index mark of the weight holder. Holder and weight are then fitted over the axis of the tonometer so that the longer part of the weight points towards the examiner.

At drum position 1.95, 2.05 respectively (graduation mark 2 on measuring drum set one line width below/above the index respectively, as shown in fig. 16) the pressure arm should return from the area of free movement to the corresponding stop.

The check at drum position 2 is the most important and should be carried out frequently, as the measurement of intraocular pressure in this range is of particular importance.

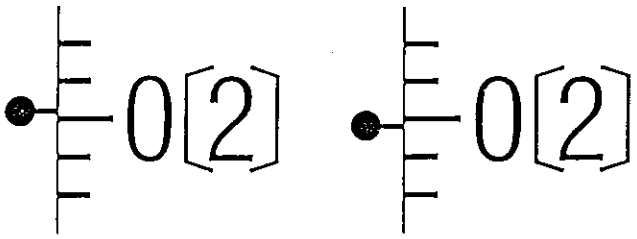


Fig. 16

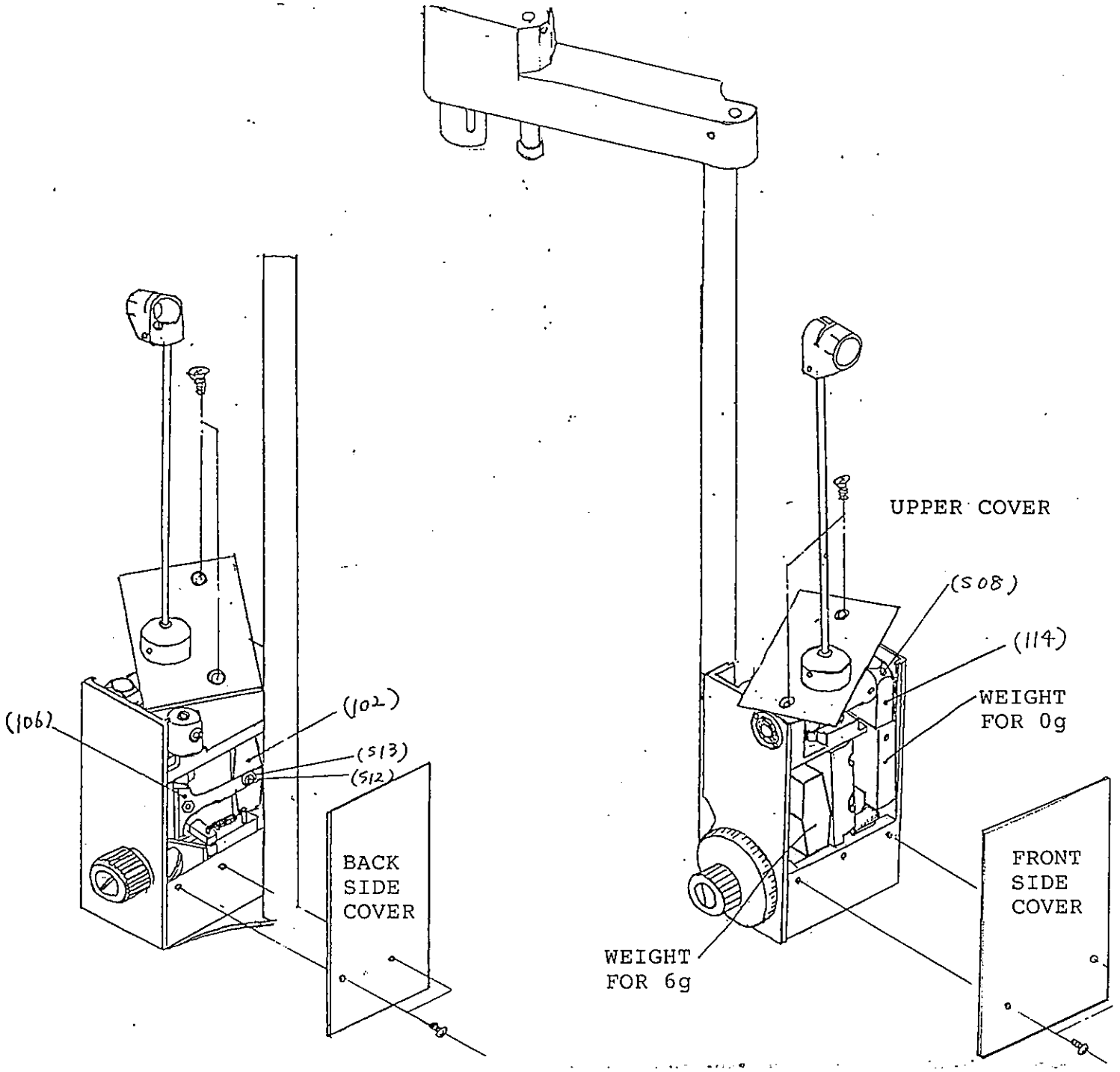
c) Checking at drum position 6

In the same manner the tonometer should be checked at drum position 6. The corresponding checking points are 5.9 and 6.1. The graduation mark 6 on the drum is offset by half an interval below or above the index.

Adjustment of the Scale (Motion by Pressure)

The following is the procedure for adjustment of scale (motion by pressure) when the scale is not show the correct value.

1. Remove the upper, front and backside outer cover.



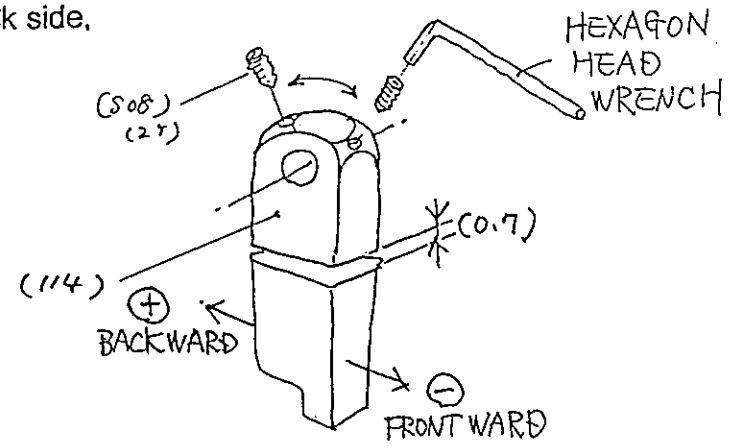
BACKSIDE VIEW

FRONT VIEW

2. "0" position adjustment of pressure knob

Loosen 2 pcs of screw (No. S08) of the parts No. 114 by hexagon head wrench. (See the attached drawing.)
Then swing the parts No.114 (weight for 0g) toward front side or backside, and tighten these screws at where the pressure-arm can move forward and backward within the range of "0± 0.2g" (one scale).

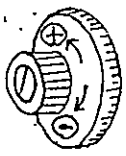
＊When the weight for 0g swings toward front side, the scale of knob moves toward minus(-).
＊When the weight for 0g swings toward back side, the scale of knob moves toward plus(+).

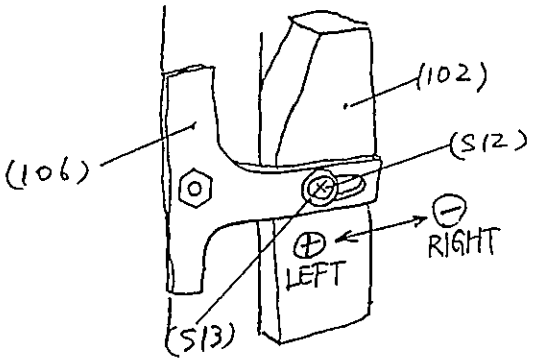


3. "6g" position adjustment of pressure knob

Loosen a screw (S12) for fixing parts No. 106 and 102. (See the attached drawing.)
Shift the parts No.102(weight for 6g) toward right and left, and tighten the screw at where the pressure-arm can move forward and backward within the range of "6g±0.2g".

＊When the weight for 6g swings toward right, the scale of knob moves toward minus(-).
＊When the weight for 6g swings toward left, the scale of knob moves toward plus(+).





4. "2g" position adjustment of pressure knob

After the above "0g" and "6g" position adjustment were completed, the "2g" position should already be adjusted within the allowable range of "2g±0.2g".
However if it is out of range, it is required to adjust again the position to be within the allowable range by means of sliding parts 102 toward plus(+) or minus(−) after loosening the screwS12.