Preface

Thank you for choosing our VIM-300 manual phoropter. Please read the manual carefully first.

CAUTION:

Only use the upper handle or the two sides of the phoropter to carry or move.

Do not lay the phoropter down or exert force on the front or back part.

Avoid touching the optical components of the device.

Avoid dusty or humid environment.

All rotation parts can be rotated in two ways. Do not rotate over the limit to avoid damage.

Do not use solvents or strong cleaning solutions.

Do not try to open or repair the phoropter without instructions from the supplier.

Avoid any collisions to the phoropter.

Please contact our company if you have any questions.

Ningbo Rongxin Ansheng Machinery Co., Ltd.

Add. 7-11 Jinzhu Nanlu, Longshan, Cixi, Zhejiang, P. R. China 315331

Email sales@rxmech.com

Web www.rxmech.com

Index

1. Overview

Introduction

Name： Phoropter

Model： VIM-300

Manufacturer： Ningbo Rongxin Ansheng Machinery Co., Ltd.

Address： 7-11 Jinzhu Nanlu, Longshan, Cixi, Zhejiang, China 315331

Phone： 0574-63739874

FAX 0574-88393230

Website： www.rxmech.com

E-mail： sales@rxmech.com

Applicable Range

The phoropter is used for subjective refraction by professional by properly trained personnel, physicians or opticians.

Specifications

No.	Item	Range	Step
1	Sphere	-19.00D ∽ +16.75D	0.25D (0.12D w/ aux lens)
2	Cylinder	0 ∽ -6.00D (0 ∽ -8.00D w/ aux lens)	0.25D (0.12D w/ aux lens)
3	Cylinder Axis	0 ∽ 180	5°
4	Cross Cylinder	0.25D	
5	Rotary Prism	0 ∽ 20	1
6	Prism Base	0 ∽ 360	5°
7	Pupil Distance	50mm ∽ 75mm	1mm
8	Convergence	380mm (@ PD=64mm)	1mm
9	Forehead Support	16mm	
10	Corneal Aligning	13.75mm	
11	Dimension	320mm(L) X 305mm(W) X 100mm(H)	
12	Weight	Net：4.75kg Total：6.55kg	

Parts and Accessories

Parts Identification

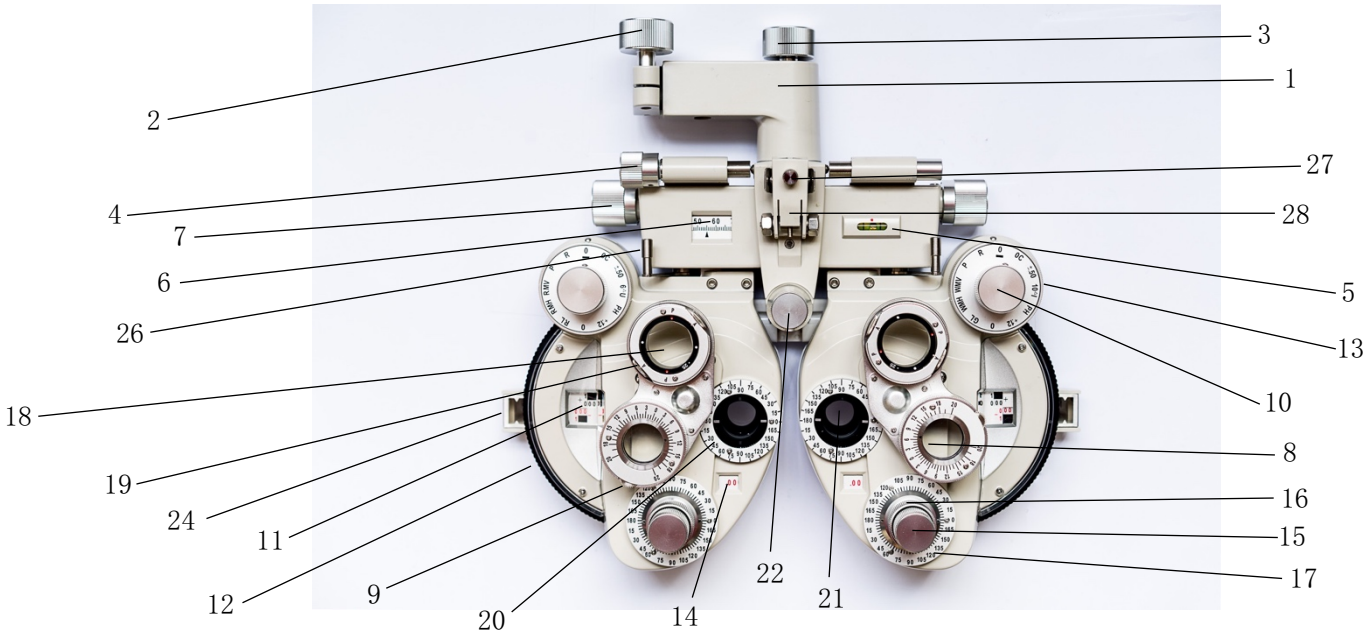

Figure 1

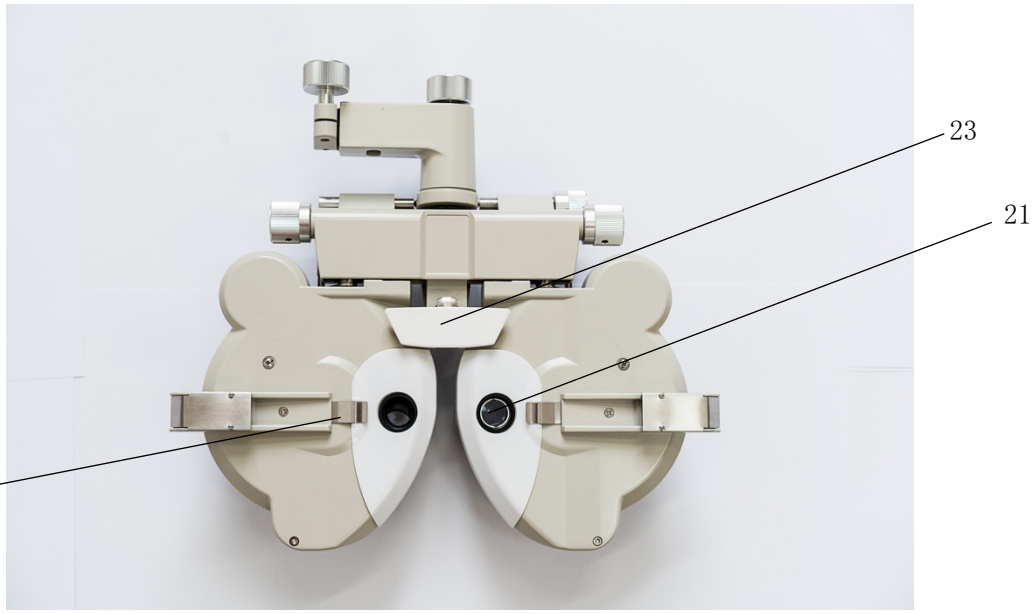

Figure 2

Item	Nomenclature
1	Mounting Bracket
2	Tilt Clamp Knob
3	Rotation Adjustment Knob
4	Leveling Knob
5	Spirit Level
6	P.D. Scale
7	P.D. Knob
8	Rotary Prism Unit
9	Prism Knob
10	Auxiliary Lens Knob
11	Sphere Power Scale
12	Weak Sphere Dial
13	Strong Sphere Control
14	Cylinder Scale
15	Cylinder Power Knob
16	Cylinder Axis Knob
17	Cylinder Axis Scale
18	Cross Cylinder Unit
19	Cross Cylinder Knob
20	Cylinder Axis Scale
21	Main Aperture
22	Forehead Rest Knob
23	Forehead Rest
24	Corneal Aligning Device
25	Face Shield Clip
26	Vergence Lever
27	Reading Rod Clamp Screw
28	Reading Rod Holder

Accessories Identification

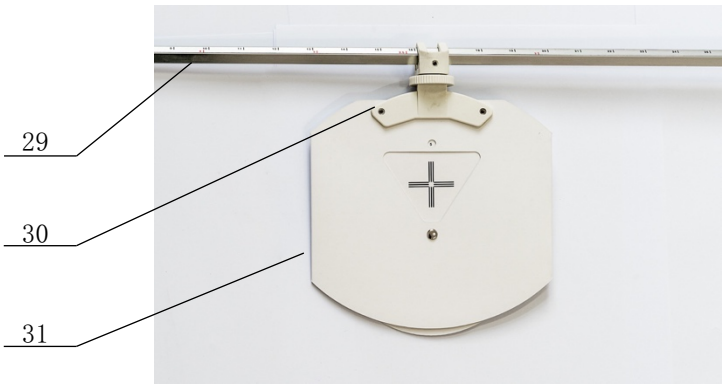

Figure 3

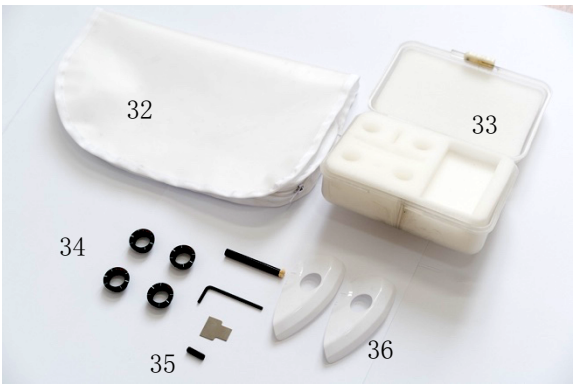

Figure 4

Item	Nomenclature
29	Reading Rod
30	Card Holder
31	Rotochart
32	Dust Cover
33	Accessory Box
34	Auxiliary Lens
35	Installation Tools
36	Face Shield

Use, Storage and Transportation Condition

Working Condition

Temperature: 10℃～40℃

Humidity: ≤80%

Transportation Condition

Temperature: -40℃-- +70℃

Humidity: 10% -- 95%

Storage Condition

Temperature: -40℃-- +55℃

Humidity: 10% -- 95%

Users

Only professional by properly trained personnel, physicians or opticians can operate the equipment.

Precautions

Only use the upper handle or the two sides of the phoropter to carry or move.

Do not lay the phoropter down or exert force on the front or back part.

Avoid touching the optical components of the device.

Avoid dusty or humid environment.

All rotation parts can be rotated in two ways. Do not rotate over the limit to avoid damage.

Do not use solvents or strong cleaning solutions.

Do not try to open or repair the phoropter without instructions from the supplier.

Avoid any collisions to the phoropter.

Year of Use

Under normal operation and maintenance, the phoropter can be used for as long as 8 years.

Production Date

See the nameplate on each instrument.

2. Installation

Attaching the Phoropter to the Stand

Place the Phoropter on the instrument stand arm by sliding the Mounting Bracket (1) over the end of the arm until the threaded hole of the stand arm lines up with the slotted hole in the bottom of the Mounting Bracket (1).

A Retaining Screw (35) has been provided in the Accessory Box (33) to prevent the Phoropter from falling off the stand. Insert the screw up through the slotted hole and thread it into the stand arm. Tighten the screw firmly in place.

Tighten the Tilt Clamp Knob (2) and the Phoropter will be held firmly in the desired position.

Move the Phoropter into a working position. Use the Leveling Adjustment Knob (4) to adjust the horizontal position of the Phoropter. Turn the Leveling Knob until the instrument is level as shown on the Spirit Level (5).

Figure 5

Near-point Accessories Installation

To attach the Rotochart, insert one pin into the hole; slide the edge under the clip; and insert the other pin into the second hole. The Card Holder (30) can be rotated to present the characters on either side of the Rotochart.

Insert the Reading Rod (29) into the hinged Reading Rod Holder (5) and tighten the Reading Rod Clamp Screw (3).

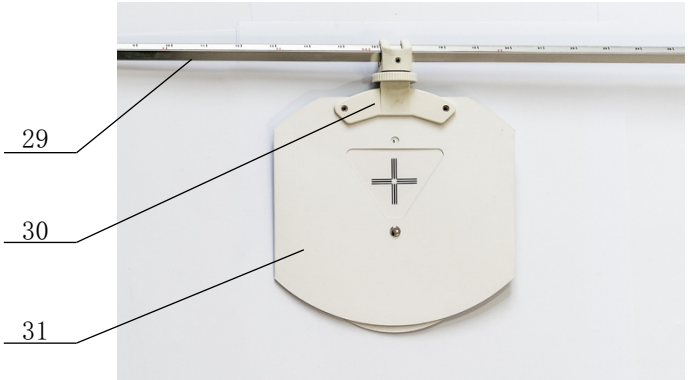

Figure 6

Figure 7

Face Shield Installation

Each Face Shield (36) is held in place by a Face Shield Clip (25). Attach by sliding the edge of the Face Shield (36) under the clip matching the position of the shield aperture to the aperture of the Phoropter.

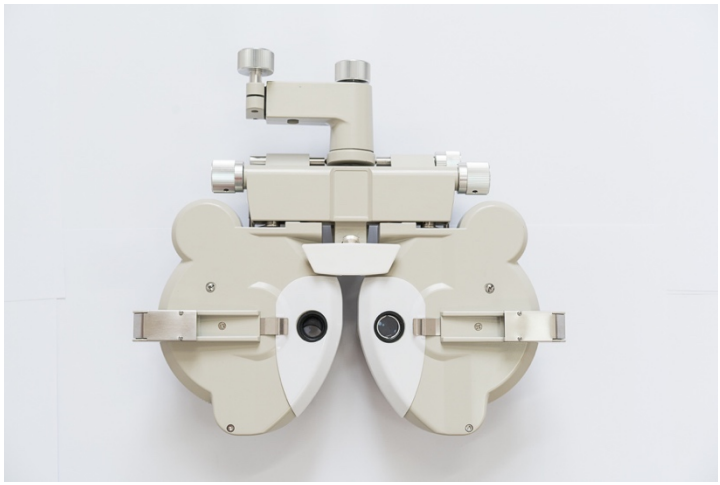

Figure 8

3. Operation

Optical Corneal Aligning Device

Figure 9

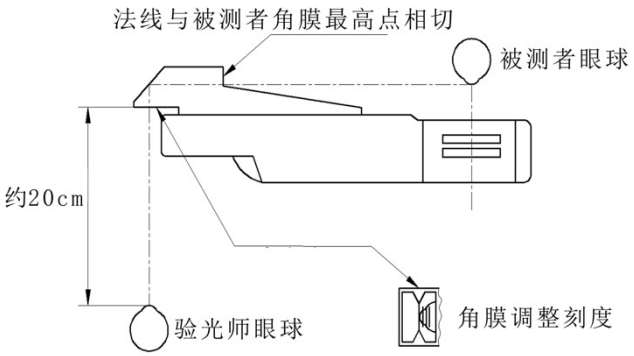

Figure 10

The Phoropter provides an optically additive lens system and an optical Corneal Aligning Device, both essential for a true additive effective power determination.

1. The additive lens system refers to the addition of lens powers within the Phoropter.

2. The effective power combination of two or more lenses cannot be obtained accurately by simple addition of their individual powers.

3. Allowances must be made which depend in an intricate way on the powers, the curves, the thicknesses, the index of glass, and the air space separating the lenses.

4. Accordingly, in the Phoropter, two essential features have been incorporated to ensure the accuracyof the lens prescription.

• Specially computed lenses and lens separations such that their designated powers can simply be added

together to give the effective power of any possible combination.

• A means for placing this additive lens power system at a specified distance from the eye.

5. When either of these elements is neglected, the corrective accuracy of the lens system is impaired, particularly with regard to combinations of high power lenses.

6. The distance at which the spectacle lens is generally worn is considered to be 13.75 mm from the apex of the cornea to the ocular surface of the lens.

7. With this as the standard, the posterior lens surface of the Phoropter must be placed at a distance of 13.75 mm if the Phoropter reading is to be directly applied to spectacle lens power.

8. In the Phoropter, this condition is obtained when the zero setting of the sight in the Corneal Aligning Device is lined up with the apex of the cornea. Refer to Figure 10.

9. To establish proper distance between the patient's eyes and the instrument, adjust the position of the Forehead Rest using the Forehead Rest Knob.

Note: Make certain that the patient's forehead is resting firmly against the headrest.

10. This adjustment will move the patient's eyes nearer to or farther from the instrument.

11. From the front of the instrument, look into the Corneal Aligning Device. The upper and lower pointers should be in exact alignment with the solid black line visible on the mirror. This is the zero point indicating a 13.75 mm distance from the apex of the patient's cornea. Also visible are three hash marks, each representing 2 mm additive distance.

12. With the patient's forehead positioned against the headrest, adjust the headrest to position the apex of the cornea at the zero line (13.75 mm from the lenses).

13. If, with the headrest retracted, the apex of the cornea appears nasally from the zero line, simply add the distance to 13.75 mm. (This figure is the total distance from the cornea to the strong sphere, or the vertex distance.)

14. The scale reading of the Corneal Aligning Device is used with the Correction Factor Table to determine the correction factor for the power reading.

Note: The correction factor is always added to the Phoropter reading as a plus quantity.

Example:

• If the Phoropter reading is +8.00D and the Corneal Aligning Device scale indicates an additional 4 mm, the correction factor according to the table is +0.27. Therefore, the power of the correcting lens is obtained by adding +0.27 to +8.00 diopters, which equals +8.27 diopters, when the spectacle lens is worn at 13.75 mm from the cornea.

• If the Phoropter reading is -11.50D, and the Corneal Aligning Device indicates an additional 5 mm, it is necessary to interpolate to obtain the correction factor. Interpolating between -11.00 and -12.00, the correction factor according to the table is +0.62. Therefore, the power of the correction lens is obtained by adding +0.62 to -11.50, which equals -10.88 diopters, when the spectacle lens is worn at 13.75 mm.

15. The tables can also be applied in the case where the spectacle lenses are to be worn at one distance, the test is made at another distance, and neither distance is at 13.75 mm.

Note: First, assume the Corneal Aligning Device indicates an additional 4 mm; that the spectacle lenses are to be worn at 12 mm instead of 13.75 mm; and that the Phoropter reading is +13.00 diopters. In this case, ftting distance of 12 mm is subtracted from the refracting distance of 17.75 mm (13.75 mm plus 4 mm), the result being 5.75 mm. In the table for plus Phoropter readings at the horizontal row corresponding with +13.00 diopters, the value of 5.75 falls between the 5 mm and 6 mm columns. By interpolation, the addition is found to be 1.05D. Hence, the power of the spectacle lens should be +13.00 plus +1.05 for a total of +14.05 diopters.

The following tables are based on the Effective Power Formula; P(e) = P/(1-(s*P))

P = Phoropter Power reported (@ 13.75mm)

s = the distance moved from the spectacle vertex distance

P(e) = the corrected power required at the spectacle vertex distance

The correction factor is the difference between the effective power and the Phoropter power cf = P(e)-P

CORRECTION FACTOR TABLE PLUS

L mm / D dptr	1	2	3	4	5	6	7	8	9	10
+1.00	0.001	0.002	0.003	0.004	0.005	0.006	0.007	0.008	0.009	0.01
+2.00	0.004	0.008	0.01	0.02	0.02	0.02	0.03	0.03	0.04	0.04
+3.00	0.009	0.02	0.03	0.04	0.05	0.06	0.06	0.07	0.08	0.09
+4.00	0.02	0.03	0.05	0.07	0.08	0.10	0.12	0.13	0.15	0.17
+5.00	0.03	0.05	0.08	0.10	0.13	0.15	0.18	0.21	0.24	0.26
+6.00	0.04	0.07	0.11	0.15	0.19	0.22	0.26	0.30	0.34	0.38
+7.00	0.05	0.10	0.15	0.20	0.25	0.31	0.36	0.42	0.47	0.53
+8.00	0.06	0.13	0.20	0.26	0.33	0.40	0.47	0.55	0.62	0.70
+9.00	0.08	0.16	0.25	0.34	0.42	0.51	0.61	0.70	0.79	0.89
+10.00	0.10	0.20	0.31	0.42	0.53	0.64	0.75	0.87	0.99	1.11
+11.00	0.12	0.25	0.38	0.51	0.64	0.78	0.92	1.06	1.21	1.36
+12.00	0.15	0.30	0.45	0.61	0.77	0.93	1.10	1.27	1.45	1.64
+13.00	0.17	0.35	0.53	0.71	0.90	1.10	1.30	1.51	1.72	1.94
+14.00	0.20	0.40	0.61	0.83	1.05	1.28	1.52	1.77	2.02	2.28
+15.00	0.23	0.46	0.71	0.96	1.22	1.48	1.76	2.05	2.34	2.65
+16.00	0.26	0.53	0.83	1.09	1.39	1.70	2.02	2.35	2.69	3.05
+17.00	0.29	0.60	0.91	1.24	1.58	1.93	2.30	2.68	3.07	3.48
+18.00	0.33	0.67	1.03	1.40	1.78	2.18	2.59	3.03	3.48	3.95
+19.00	0.37	0.75	1.15	1.56	1.99	2.44	2.91	3.41	3.92	4.46
+20.00	0.41	0.83	1.28	1.74	2.22	2.73	3.26	3.81	4.39	5.00

CORRECTION FACTOR TABLE MINUS

L mm / D dptr	1	2	3	4	5	6	7	8	9	10
-1.00	0.001	0.002	0.003	0.004	0.005	0.006	0.007	0.008	0.009	0.01

-2.00	0.004	0.008	0.01	0.02	0.02	0.02	0.03	0.03	0.04	0.04
-3.00	0.009	0.02	0.03	0.04	0.04	0.05	0.06	0.07	0.08	0.09
-4.00	0.02	0.03	0.05	0.06	0.08	0.09	0.11	0.12	0.14	0.15
-5.00	0.02	0.05	0.07	0.10	0.12	0.15	0.17	0.19	0.22	0.24
-6.00	0.04	0.07	0.11	0.14	0.17	0.21	0.24	0.27	0.31	0.34
-7.00	0.05	0.10	0.14	0.19	0.24	0.28	0.33	0.37	0.41	0.46
-8.00	0.06	0.13	0.19	0.25	0.31	0.37	0.42	0.48	0.54	0.59
-9.00	0.08	0.16	0.24	0.31	0.39	0.46	0.53	0.60	0.67	0.74
-10.00	0.10	0.20	0.29	0.38	0.48	0.57	0.65	0.74	0.83	0.91
-	0.12	0.24	0.35	0.46	0.57	0.68	0.79	0.89	0.99	1.09
-12.00	0.14	0.28	0.42	0.55	0.68	0.81	0.93	1.05	1.17	1.29
-13.00	0.17	0.33	0.49	0.64	0.79	0.94	1.08	1.22	1.36	1.50
-14.00	0.19	0.38	0.56	0.74	0.92	1.08	1.25	1.41	1.57	1.72
-15.00	0.22	0.44	0.65	0.85	1.05	1.24	1.43	1.61	1.78	1.96
-16.00	0.25	0.50	0.73	0.96	1.19	1.40	1.61	1.82	2.01	2.21
-17.00	0.28	0.56	0.82	1.08	1.33	1.57	1.81	2.04	2.26	2.47
-18.00	0.32	0.63	0.92	1.21	1.49	1.75	2.01	2.27	2.51	2.75
-19.00	0.35	0.70	1.02	1.34	1.65	1.94	2.23	2.51	2.77	3.03
-20.00	0.39	0.77	1.13	1.48	1.82	2.14	2.46	2.76	3.05	3.33

Sphere Lens Dials

1. All sphere powers, plus and minus, can be introduced into the lens aperture in steps of 0.25D by rotation of a single lens dial, (+0.12D sphere in the Auxiliary Lens Knob can be used to refine the spherical correction to 1/8th D steps.)

2. The operation is simple. Rotation of the Weak Sphere Dial downward (i.e. clockwise for the left eye, counterclockwise for the right eye.) introduces more plus power or less minus. Refer to Figure 11.

3. Rotation of the Weak Sphere Dial upward introduces more minus power or less plus.

Note: Plus powers are indicated by black numbers; minus powers, by red numbers.

4. An automatic pick-up system links the two sphere power dials so that whenever a change in power is required in the Strong Sphere Dial, it is automatically moved by the Weak Sphere Dial. Thus, one may dial completely through the +16.75D to -19.00D range in 0.25D steps by rotation of only the Weak Sphere Dial.

5. However, high power may also be introduced quickly and easily by means of the Strong Sphere Control when desired. Refer to Figure 12.

6. The Strong Sphere Control introduces sphere power in 3.00D steps and can often be used as a time saver.

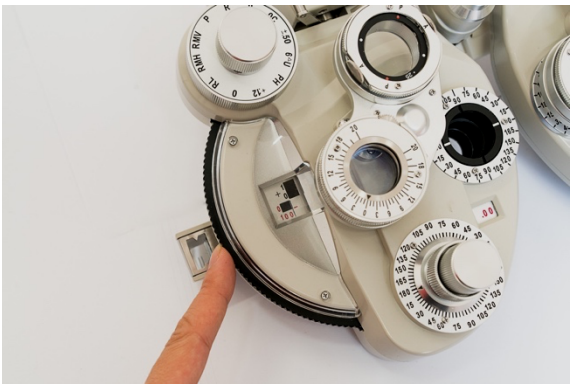

Figure 11

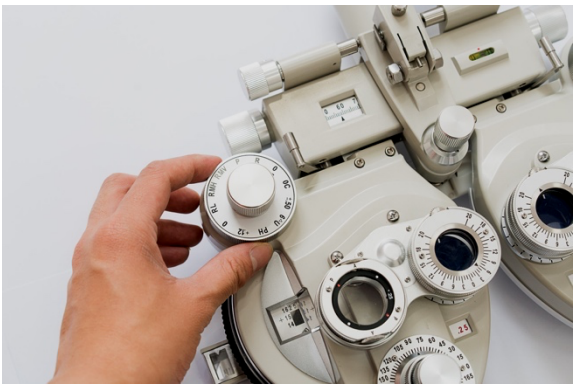

Figure 12

Examples:

• To obtain a power of +2.75D (starting from zero), the practitioner could add plus power in quarter diopter steps by rotating the Weak Sphere Dial downward until +2.75D shows on the sphere power scale.

• A quicker way: rotate the Strong Sphere Control nasally one index position to introduce a value of +3.00. Rotate Weak Sphere Dial one index upward to reduce power to +2.75D.

• To obtain a power of +7.00D (starting from zero) the quickest way: rotate Strong Sphere Control nasally two index positions to introduce a value of +6.00D. Rotate Weak Sphere Dial four index positions downward to increase power to +7.00D.

• To obtain a power of -3.50D (starting from zero) the quickest way: rotate Strong Sphere Control temporally one index to introduce a value of -3.00D. Rotate Weak Sphere Dial two index positions upward to increase power to -3.50D.

Cylinder Power and Axis

1. In the Cylinder Lens Dials, which are controlled by turning the Cylinder Power Knobs, the powers range from 0.00 to -6.00D for instruments containing minus cylinders, and from 0.00 to +6.00D for instruments containing plus cylinders.

2. Cylinder power can be changed in steps of 0.25D throughout the full range by means of the Cylinder Power Knob.

3. To increase power, knobs are turned clockwise. Refer to Figure 13.

4. A pair of 0.12D cylinders in accessory cells permits refinement to 1/8th D steps.

5. A pair of 2.00D cylinders in accessory cells extends cylinder power range to 8.00D.

6. Large 360° protractors around the Cylinder Axis Knobs mark the position of the axis from 0° to 180° in steps of 5°.

7. The Rx axis reading is taken from the scale at the Cylinder Axis Knob.

8. The axis scale around the aperture is provided for reference during retinoscopy.

9. The Cylinder Axis Knob (concentric with power knob) can be continuously turned clockwise or counterclockwise to set the axis of the cylinder in any meridian from 0° to 180°. Refer to Figure 14.

Figure 13

Figure 14

Auxiliary Lens Dial

The Auxiliary Lens Dial is controlled by turning the Auxiliary Lens Knob. The Phoropter provides a selection of 10 auxiliary lenses plus two open apertures. Refer to Figure 15.

Figure 15

Beginning at “O” (open aperture) at the top of the scale, the lenses will index into position in the following order as you turn the Auxiliary Lens Knob clockwise:

R	Retinoscopic Lens*	+1.50D; low reflection coated. Compensates for working distance during retinoscopy. For example, the standard 1.50D lens compensates for the convenient working distance of 26 inches.
P	Polarizing Lens	For binocular refraction techniques, axis is 45° left eye, 135° right eye.
WMV RMV	Maddox Rod, Vertical*	White, left eye, red, right eye. For muscle balance tests.
WMH RMH	Maddox Rod, Horizontal*	White, left eye, red, right eye. For muscle balance tests.
RL	Red Lens	For binocular vision tests.
GL	Green Lens	For binocular vision tests.

O	Open Aperture	Second open aperture provided as a convenience feature. Never have to turn all the way back.
+.12	+0.12D Sphere	Refines spherical correction to 1/8thD steps.
PH	Pin Hole	Opaque disk with small hole. Used to determine if a patient's vision problem is pathological or a refraction error.
10 ΔI 6 ΔU	10 base-in left eye 6 base-up right eye	Dissociating prisms.
±.50	±0.50D Fixed Cross Cylinder*	Axis preset for dynamic CC and dissociated CC tests (described in Near Point Rotochart Manual.)
OC	Occluder	Covers one eye during refraction.

To replace lenses in Auxiliary Dial:

Five lenses in each dial are cell mounted: the retinoscopic, polarizing, both Maddox rods, and fixed cross cylinder lenses are in individual cells permitting substitution of special lenses. Two washers and screws retain each cell. Refer to Figure 17.

To remove cell from dial:

1. Turn the Auxiliary Dial Knob until one of the two retaining screws is visible in the rear of the main aperture.

2. Turn the screw 1/4 turn counterclockwise- do not remove- until the washer can be rotated to place the flat side of washer toward the cell.

3. Gently retighten the screw.

4. Turn the knob until the other screw and washer are visible in the aperture.

5. Repeat the preceding step.

6. Next, turn the knob to center the cell in the aperture.

7. Gently press the cell out of the auxiliary dial thru the rear of the aperture.

8. The procedure is reversed to install a new cell mounted auxiliary lens.

9. Make certain that the "notches" in the cell are positioned to permit entry of retaining washers.

10. To lock new cell into position: turn the screw 1/4 turn; rotate washer so that flat side is 900 away from cell; tighten the screw firmly.

11. Repeat for the other screw and washer.

Figure 16

Figure 17

Cross Cylinders

1. The standard cross cylinder cells supplied are +0.25D. These cells are removable and +0.37D and +0.50D are available and may be substituted.

2. The power of the cross cylinder is engraved on the cell.

3. Red dots indicate the minus axis, and white dots the plus axis.

4. A thumb-operated Roll Knob provides for rapid “flipping” of cross cylinders. Refer to Figure 18.

Note: The simplified, synchronized action of the Cross Cylinder Unit is described in the following page.

Figure 18

Figure 19

To change the Cross Cylinder Lens Assembly:

The cross cylinder is changed as a complete assembly. Follow the procedure below.

1. Using a 0.060-6 Spline Screwdriver, remove the two spline screws.

2. Lift off the retaining ring.

3. Lift out the complete Cross Cylinder Lens Assembly.

4. Reverse the procedure to install a new cross cylinder.

Note: Assembly is symmetrical so either side can face outward.

Figure 20

Rotary Prisms

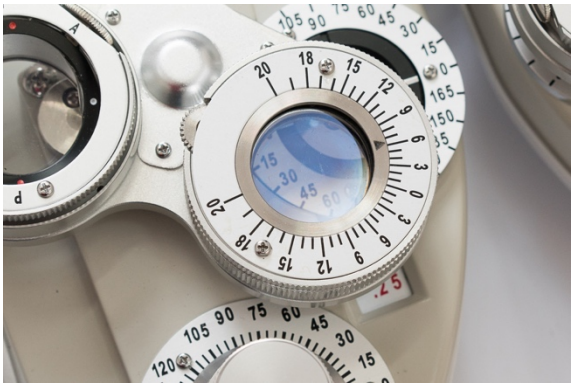

Figure 21

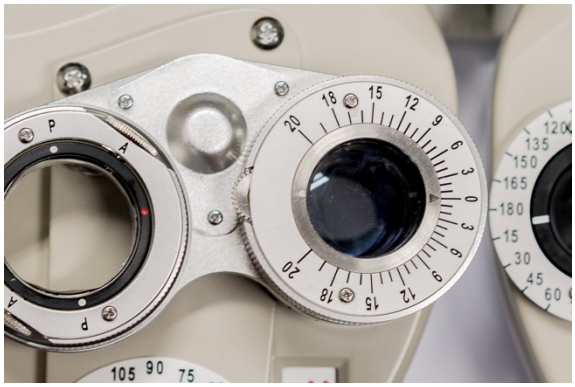

Figure 22

1. Each Rotary Prism Unit (loupe) has a range of 20△.

2. Paired, prisms give 40△ in any base direction.

3. The scale is marked in broad divisions of one prism diopter (△).

4. The Rotary Prism Unit and the Cross Cylinder Unit are attached to the Turret Assembly. The Turret Assembly rotates to locate either the Rotary Prism Unit or the Cross Cylinder Unit in front of the patient's eye. Refer to Figure 21.

When testing for prism rotate the Rotary Prism Unit in front of the eye. With the Rotary Prism Unit in front of the patient's eye, the unit can be oriented to determine base up, base down, base in, or base out prism.

5. The Finger Roll Knob rotates the prism lenses inside the Rotary Prism Unit and varies the magnitude of prism.

• When the Finger Roll Knob is located at either the top or bottom of the Rotary Prism Unit, the prism change will be base in or base out as the Finger Roll Knob is rotated.

• When the Finger Roll Knob is located on either the left or right side of the Rotary Prism Unit, the prism change will be base up or base down as the Finger Roll Knob is rotated.

Note: With the Rotary Prism set for introducing base in or base out prism, the arrowhead positioned nasally from 0△ denotes base in prism. Refer to Figure 22.

Near Test

1. All tests for near (dynamic retinoscopy, amplitude of accommodation, dynamic cross cylinder, positive and negative relative accommodation) are generally made with the Vergence Levers in the inward (converged) position. Refer to Figure 23.

2. With a distance PD of 64mm, moving both levers from the extreme outward position to the extreme inward position converges the instrument apertures for the near test at 16 inches. At the same time, aperture separation is decreased by 4mm.

3. For PD settings greater than 64mm, the instrument apertures are slightly under converged; reducing the PD adjustment by 1mm or less compensates for it.

4. For PD settings less than 64mm, the instrument apertures are slightly over converged; this is corrected by slight outward adjustment of the levers.

Note: Do not attempt to fully converge the instrument below 55mm distance PD.

Figure 23

Figure 24

4. Jackson Cross Cylinder Tests

One of the unique features of the Phoropter is that the Cross Cylinder Unit (loupe) lenses are geared together with the correcting cylinder test lenses so that when a change in axis is made in the latter, a corresponding change will automatically occur in the axis of the cross cylinder lenses. This feature relieves the practitioner of the necessity of manually changing the cross cylinder axis each time the correcting cylinder axis is changed.

Note: Because most practitioners prefer to check cylinder axis before checking cylinder power, the procedure is written in this sequence. If you prefer to check power first, reverse the sequence and perform a final power check after the axis check.

Procedure

1. With the tentative sphere and correcting cylinder (determined by retinoscopy and/or the astigmatic chart) in place, the Cross Cylinder Unit is positioned before the aperture of the eye being tested.

2. The patient fixates on the smallest line of legible letters.

Axis Check

1. The Cross Cylinder Unit is in the correct position for axis check when the axis of the Finger Roll Knobs (handles) correspond to the axis of the correcting cylinder and the red and white dots are 45° from the correcting cylinder axis.

2. Rotate the Turret Assembly to position the Cross Cylinder Unit in front of the main aperture (Roll Knobs should correspond to the axis of the correcting cylinder).

3. If the cross cylinder is not in the correct position (i.e. axis 45° from the correcting cylinder axis), the practitioner need only rotate the Cross Cylinder Unit 45° counterclockwise to detent.

4. The axis check test is performed in the usual manner with the cross cylinder lens flipped from position I to position II.

a. If vision is improved in one position, but made worse in the other position, the minus* correcting cylinder axis is rotated toward the position of the red dots in which vision is improved.

Note: As the correcting cylinder axis is rotated, the cross cylinder axis is automatically rotated a corresponding amount. Hence, the practitioner does not have to manually rotate the cross cylinder the same amount as the correcting cylinder for the subsequent rechecks.

b. Again, recheck for axis following any modification made in the correcting cylinder axis and by following procedure as in (a) until final end-point is reached.

c. End-point is reached (i.e. correcting cylinder axis is correct) when vision is equally impaired by flipping cross cylinder lens from position I to position II.

Power Check

1. To reach the power check position from axis check, the practitioner merely rotates the unit clockwise to the next detent position. Visual confirmation of the correct power check position finds the white dots, or the red dots and letters “P” (for power) on the cross cylinder.

Note: Set Cross Cylinder Unit for power check (“P” on cylinder unit should be parallel to correcting cylinder axis.)

*When plus, instead of minus, correcting cylinders are used, attention is given to the white dots, instead of the red dots on the cross cylinder lens.

2. Since the cross cylinder is in the axis check position, the practitioner merely rotates the unit 45° clockwise to the detent for proper power check positioning. The power check test is performed in the usual manner with the cross cylinder lens flipped from position I to position II.

a. If vision is better with red dots parallel to correcting minus* cylinder axis, power of correcting cylinder is increased.

b. If vision is better with red dots perpendicular to correcting minus* cylinder axis, power of correcting cylinder is reduced.

c. End-point is obtained (i.e. correcting cylinder power is correct) when vision is equally impaired by flipping cross cylinder lens from Position I to Position II.

3. At the end of each refraction, the Cross Cylinder Unit should be rotated 45° counterclockwise to the detent so that for the next refraction the cross cylinder axis will be positioned 45° from the correcting cylinder axis (i.e. Thumb Roll Knobs parallel to arrows on axis knobs). This presets the instrument for the axis check during the next refraction.

*When plus, instead of minus, correcting cylinders are used, attention is given to the white dots, instead of the red dots on the cross cylinder lens

5. Maintenance

Daily Maintenance

Always place Dust Cover on Phoropter when not in use.

Store the Phoropter in a clean and dry place.

Cleaning

Make it a habit to always keep your Phoropter covered when it is not in use. The Dust Cover provided will aid in keeping lenses clean and keep dust from working inside the instrument and eventually contaminating the lubricant. Keep the exterior surfaces clean by periodically wiping it with a clean, dry cloth. If there are stains that are hard to remove, moisten the soft cloth with a mild soap solution (1 cc of liquid dish soap to one liter of clean, filtered water (filtered below 5 microns)).

Caution: Do not drip any fluids into the phoropter.

Caution: Do not use alcohol or acetone or any strong solvents.

Note: All lens disc apertures are “open” when the Sphere Power Scale and Cylinder Power Scale read zero and the Auxiliary Lens Dial Knob is set at “0”.

Caution: Do not test for an open aperture by inserting fingers in the aperture as lens surface contacted will be soiled.

Troubleshooting

Desired lens not in aperture.	Make sure the lens selected is correct and the knobs/dials are in place.
Dials or knobs too tight.	If the temperature is low, place the phoropter in a warmer place. The internal lubricants won’t flow under a certain temperature. In normal condition, loosen the coordinating screws. Ask manufacturer for detail.
Dials or knobs too loose.	Tighten the coordinating screws. Ask manufacturer for detail.

6. Service Contact

If there is any mechanical failure of the Phoropter, contact the manufacturer.

Ningbo Rongxin Ansheng Machinery Co., Ltd.

Add. 7-11 Jinzhu Nanlu, Longshan, Cixi, Zhejiang, P. R. China 315331

Email sales@rxmech.com

Web www.rxmech.com