TRIAL CASE LENSES

Trial Lens set or Trial Lens Kit Mainly consists of positive and negative sphere lens, positive and negative cylinder lens, prism lens and accessory lens etc. According to different usage, there're bascially 68 lens set, 90 lens set, 104 lens set, 158 lens set, 232 lens set and 266 lens set. The trial lens set normally come with a trial frame.


The trial lens system also simulates the effect of eyeglasses in a more direct way. It uses a special eyeglass frame (the trial frame) into which interchangeable, calibrated lenses can be readily placed (solo or in combination) until the best vision is obtained. The prescription then specifies the parameters of eyeglass lenses that should parallel the optical behavior of the final setup in the trial frame. The entire “kit” of trial frame and a large arsenal of different trial lenses (perhaps as many as 266 of them) is often housed in a tidy case, leading to the entire system often being called a trial case.

Trial case lenses can be divided into categories as below:

4.1 Spherical-power trial case lenses

A spherical-power trial case lens consists of a positive and a negative spherical-power trial case lens. Positive spherical-power trial case lenses are used for the detection of hyperopia and presbyopia in the human eye; negative spherical-power trial case lenses are used for the detection of myopia.

4.2 Cylinder-power trial case lenses

A cylinder-power trial case lens consists of a positive and a negative cylinder-power trial case lens. Positive cylinder-power trial case lenses are used for the detection of the hyperopia, presbyopia and astigmatism in the human eye; negative cylinder-power trial case lenses are used for the detection of the myopia and astigmatism in humans.

4.3 Prismatic-power trial case lenses

Used for the detection of the strabismus and heterophoria in the human eye.

4.4 Supplemental trial case lenses

Supplemental trial case lenses normally consist of cross-cylinder lenses, maddox rod lenses, pinhole lenses, opaque lenses, stenopeic lenses, plano lenses, frosted lenses, crosshair lenses, filters and polarisers, etc.

4.4.1 Cross-cylinder lenses

A cross-cylinder lens is a type of special cylindrical lens, which has two mutual perpendicular orientations, indicated by the same two numerical values with opposing plus and minus symbols, marking the positive and negative cylindrical vertex powers respectively. Cross-cylinder lenses are used for the detection of the axial position and the cylindrical power of cylindrical lenses.

4.4.2 Maddox rod lenses

A maddox rod lens consists of a row of smooth cylinders with the same diameter, and has the function of light transmission.

4.4.3 Opaque lenses

Opaque lenses are also called opaque discs. These lenses are completely opaque and are used to cover whichever eye is not undergoing examination.

4.4.4 Pinhole lenses

A pinhole lens is an opaque lens with a clear aperture in the centre. It is mainly used to distinguish whether hypophysial eyes are caused by refractive errors or pathological change of the eyes. The clear aperture should be round, smooth, and other parts of the pinhole lens should not allow light to pass through.

4.4.5 Stenopeic slit lenses

A stenopeic slit lens is an opaque lens with a narrow slit which allows light transmission. Stenopeic slit lenses are used for astigmatism inspection.

4.4.6 Frosted lenses

Frosted lenses are semi-transparent and are used by young children or outdoors to replace opaque lenses.

4.4.7 Plano lenses

Plano lenses are transparent and are used to test conditions such as simulated blindness.

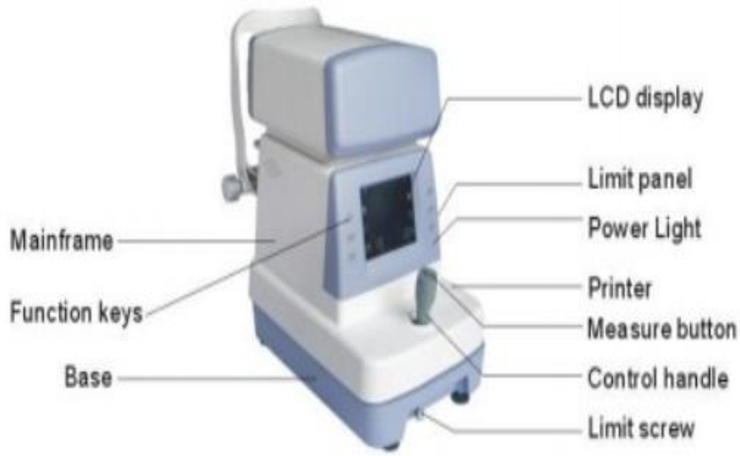
4.4.8 Crosshair lens

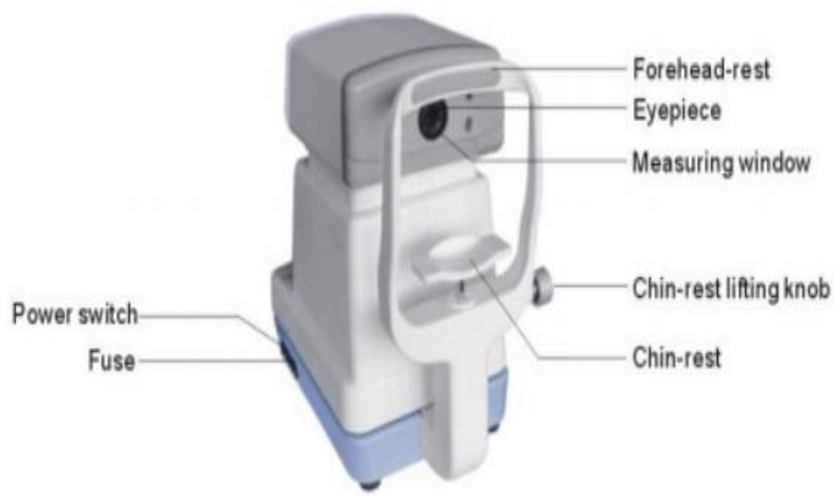
A crosshair lens is a plano lens which is etched with a crosshair shape. It is mainly used to determine the centre of an eye and determine the eye position when checking strabismus.

4.4.9 Filters

Filters are plano lenses. They normally include red and green lenses, used for chromatoptometry. The combination of red and green lenses can be used for binocular stereo vision testing, or for visual function testing of people with refractive media opacity. Red filters can also be used for amblyopia treatment and for chromatoptometry. There is also a tawny filter which can be used in lenses for examining the vision of people with photophobia.

AUTO REFRACTOMETER / DIOPTRON





An autorefractor or automated refractor is a computer-controlled machine used during an eye examination to provide an objective measurement of a person's refractive error and prescription for glasses or contact lenses. This is achieved by measuring how light is changed as it enters a person's eye.

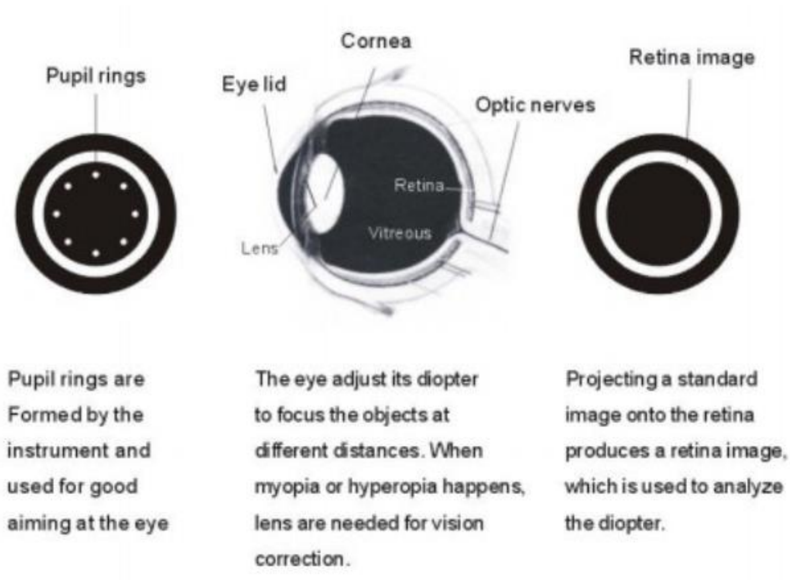
It is a precision ophthalmic instrument. It is used to measure parameters of farsightedness, near sightedness, astigmatism, axis and pupil distance diagnosis.

Instrument for measuring the refractive state of the eye is an optometer. There are two main types of optometers: subjective and objective. Subjective optometers rely upon the subject's judgment of sharpness or blurredness of a test object while objective ones contain an optical system which determines the vergence of light reflected from the subject's retina. Electronic optometers in which all data appear digitally within a brief period of time after the operator has activated a signal can be of either type. Objective types (also called autorefractors or autorefractometers) have become very popular and several of these autorefractors are now providing both objective and subjective systems within the same instrument.

Principle

The speed of light in a vacuum is always the same, but when light moves through any other medium it travels more slowly since it is constantly being absorbed and reemitted by the atoms in the material. The ratio of the speed of light in a vacuum to the speed of light in another substance is defined as the index of refraction (aka refractive index or n) for the substance.

The majority of autorefractors calculate the vision correction a patient needs (refraction) by using sensors that detect the reflections from a cone of infrared light. These reflections are used to determine the size and shape of a ring at the back of the eye called the retina. By measuring this zone, the autorefractor can determine when a patient's eye properly focuses an image. The instrument changes its magnification until the image comes into focus. The process is repeated in at least three meridians of the eye and the autorefractor calculates the refraction of the eye, sphere, cylinder and axis.



The refractometer projects a standard IR image to the retina of the eye. By means of analyzing the image on the retina, it can measure myopia, hyperopia, astigmatism and axis. In order for precision measurement, a good alignment with the eye is essential.

RETINISCOPY/RETINOSCOPE

Retinoscopy (also called skiascopy) is a technique to objectively determine the refractive error of the eye (farsighted, nearsighted, astigmatism) and the need for glasses. The test can be quick, easy, reliably accurate and requires minimal cooperation from the patient.

The examiner uses a retinoscope to shine light into the patient's eye and observes the reflection (reflex) off the patient's retina. While moving the streak or spot of light across the pupil the examiner observes the relative movement of the reflex or manually places lenses over the eye (using a trial frame and trial lenses) to "neutralize" the reflex. Retinoscope is an instrument which uses refracted light which is send off the pupil, this helps the doctor to determine whether a patient needs corective lens or not.

Working

When we shine the light of a retinoscope into a person’s eye,we can look at the loght reflected back from the retina.This reflected light is called the retinoscopic relex or ret reflex. It looks like a red light inside the pupil.

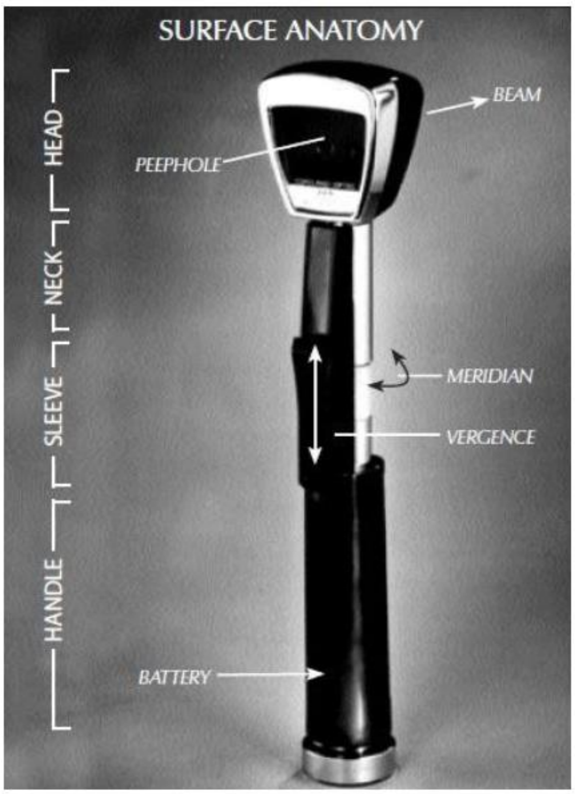
Depending on the person's refractive error,when we move the retinoscope, the ret reflex will move ina particular way inside the pupil.

Types Of Retinoscopy:

There are mainly two types of retinoscopy. They are: Spot and Streak

Spot retiniscope – Has a light globe that gives a patch or spot of light.

Streak retiniscope – Has a special globe that gives a line or streak of light.



A hand held instrument called a retinoscope projects a beam of light into the eye . When the light is moved vertically and horizontally across the eye, the examiner observes the movement of the reflected light from the back of the eye. This reflection is called red reflex. The examiner then introduces lenses in front of the eye and as the power of the lenses changes, there is a corresponding change in the direction and pattern of the reflection. The examiner keeps changing the lenses until reaching a lens power that indicates the refractive error of the patient.

Parts of a retinoscope

Power switch – Turns the device on and off, controls the brightness of the light

Small globe/Bulb- Provides the light

Electrical Supply – Batteries/Power chord

Mirror- Reflects light from globe to the eye

Sight/Viewing Hole – Allows the ret reflex to be seen.

Sleeve – Rotates the axis of the retinoscope's light and changes the light beam from divergent to convergent.