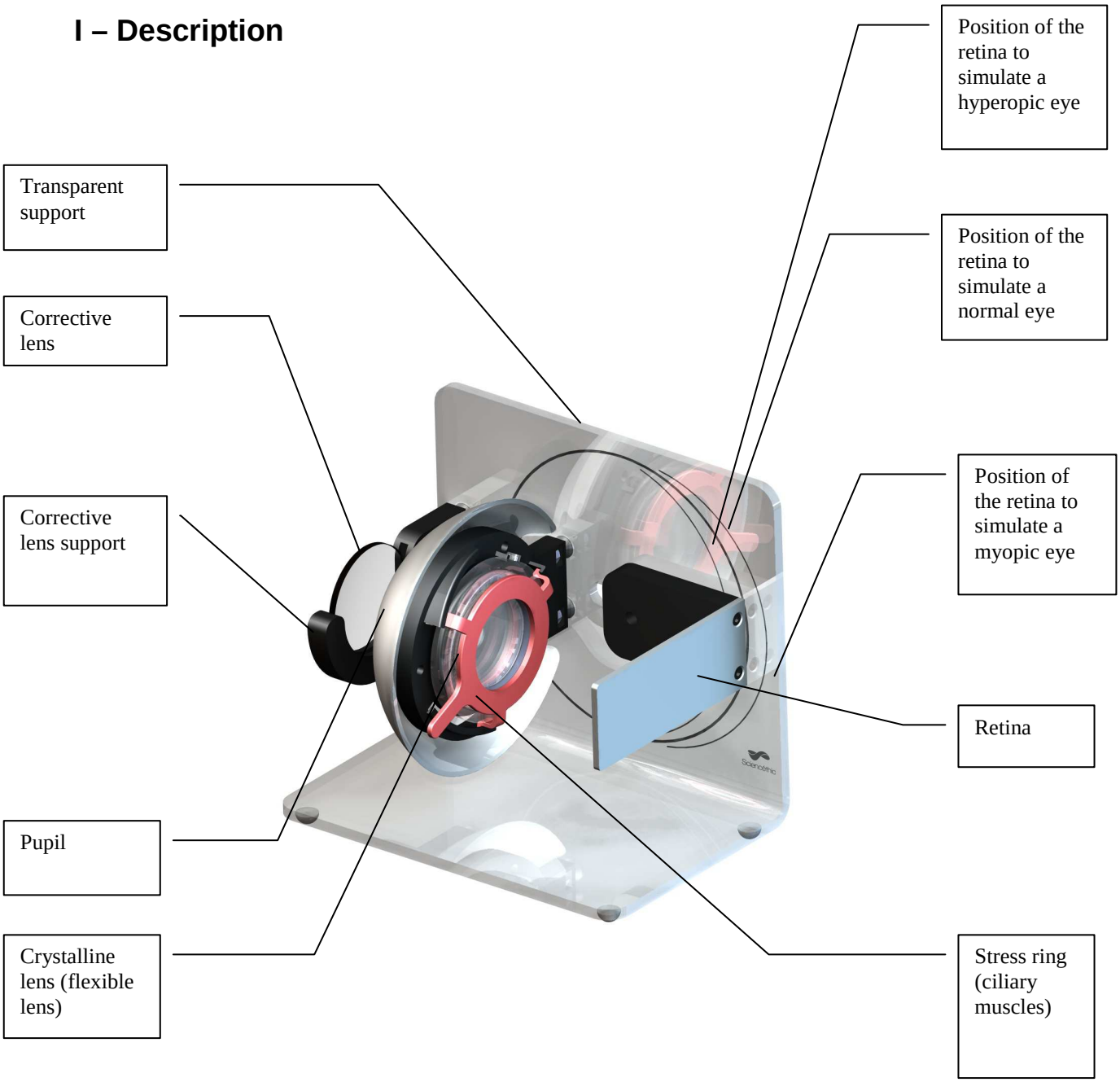
Sciencéthic

MODEL OF THE EYE Ref. 004 052

I – Description



This model is a model of the eye including a variable focus flexible lens modelling the crystalline lens. The accommodation of the crystalline lens occurs via mechanical stress (screwable ring) applied to the flexible lens similar to the action of ciliary muscles.

The retina is represented by a screen sliding along the optical axis thus simulating eye defects (myopia, hyperopia).

A lens support located in front of the eye enables the corrective lens to be positioned.

II – Composition

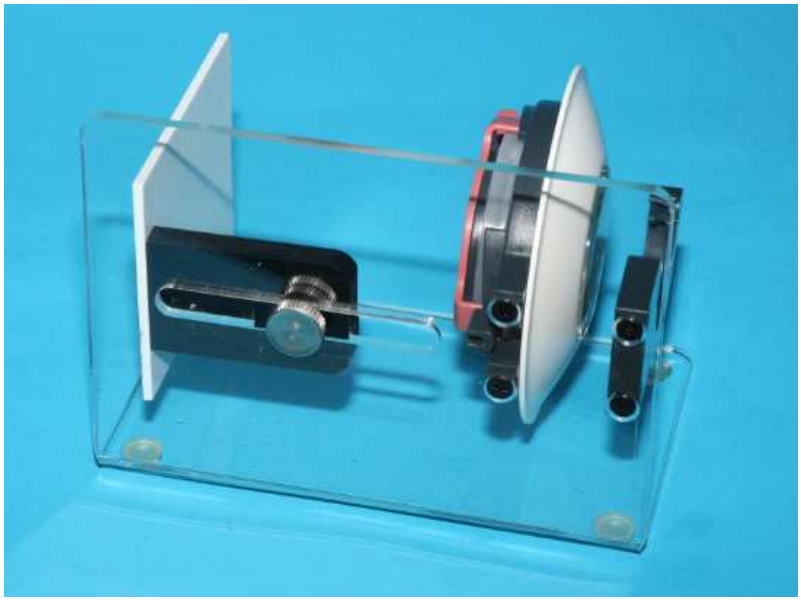
1 Model of the eye
1 Set of 2 corrective lenses F-1000 and F+1000
1 hypodermic syringe
1 Manual

III– Commissioning

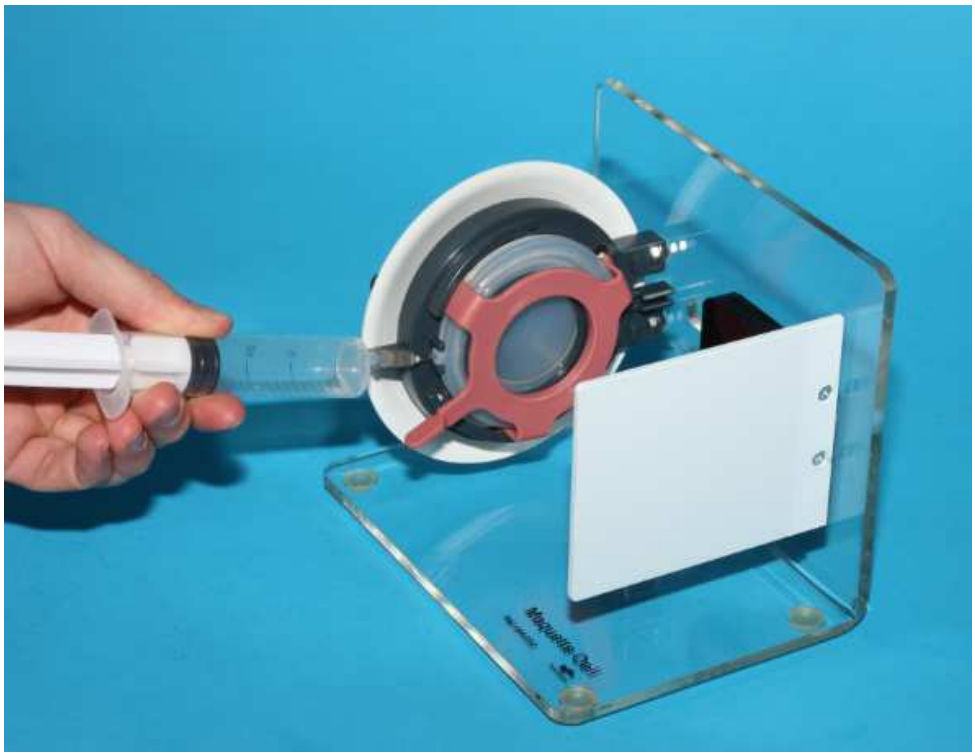
The flexible lens (crystalline lens) is delivered in an empty state. Put the needle on the syringe.

Here are the steps to follow to have the eye model ready to use (procedure to be followed only once for the first use):

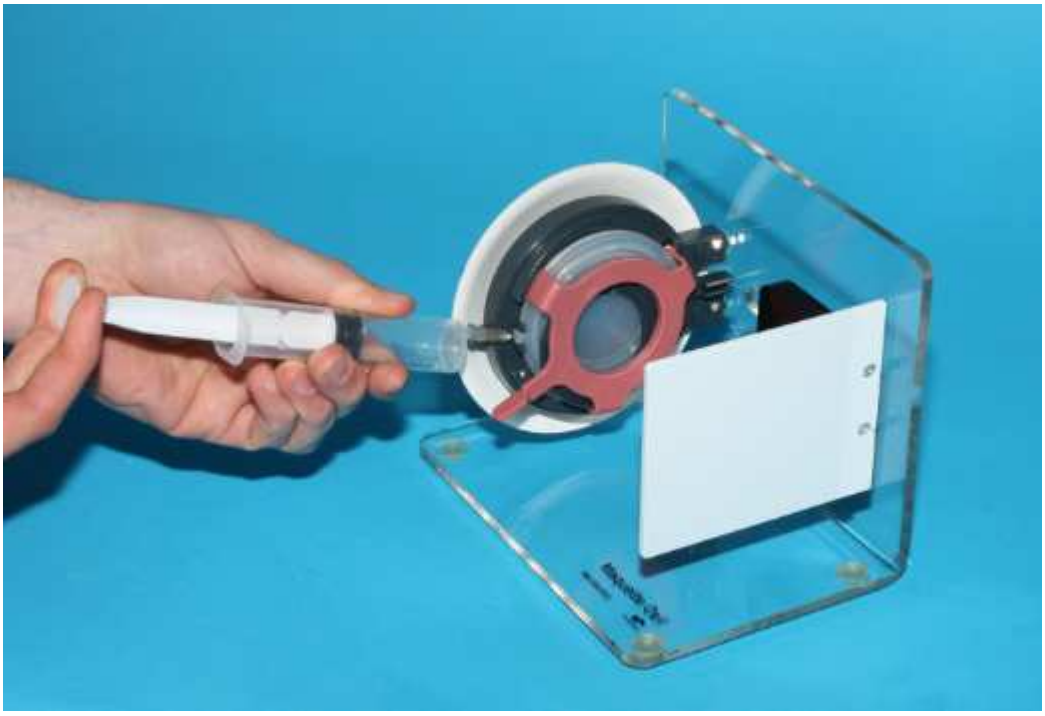
1) Place the retina setting button at the center of the rail as shown below:



2) Insert the syringe into the lens on the appropriate hole (insert the needle as little as possible)



3) Suck the air out of the crystalline as shown below. Remove the syringe.



4) Find an object at a distance of infinity (for example the landscape visible through a class window) that is slightly visible on the retina screen. The image should not be sharp yet at this stage.

5) Insert the syringe into the lens and fill in with water until the previous object becomes sharp. Stop filling in water as soon as you get a sharp object. If you fill in too much, the object will become blurred and you will have to suck water out this the syringe to get back your sharp object.

6) Your eye model is ready to be used! This procedure should be done only once for all future experiments.

CAUTION:

In order to avoid piercing the lens membrane with the needle, a few cautionary measures must be taken:

- Target the centre of the septum

- Control the angle of inclination of the needle so as not to pierce the lens wall.

- Insert the needle as little as possible into the septum so that the tip of the needle just touches the septum entrance inside the lens

- If there is any air bubble contained inside the lens, you should push up (with the fingers pressing slightly the cristallin) the bubble on the top and suck it out carefully with the syringe.

IV– Manipulations

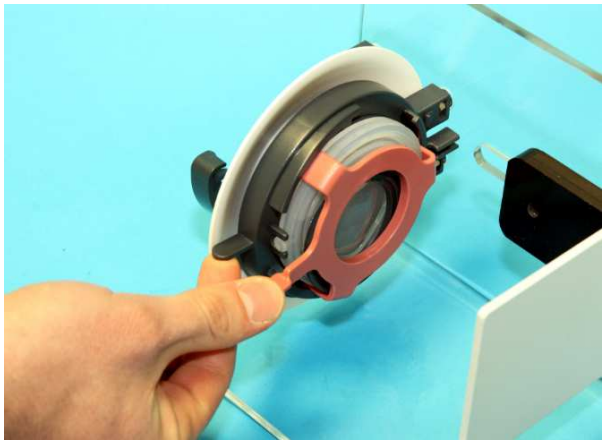
Study of the crystalline lens and modifying its vergence
The stress ring enables you to regularly increase the force applied to the entire perimeter of the lens, by simply rotating by 90 degrees.
The force applied by the ring models the action performed by ciliary muscles on the crystalline lens.

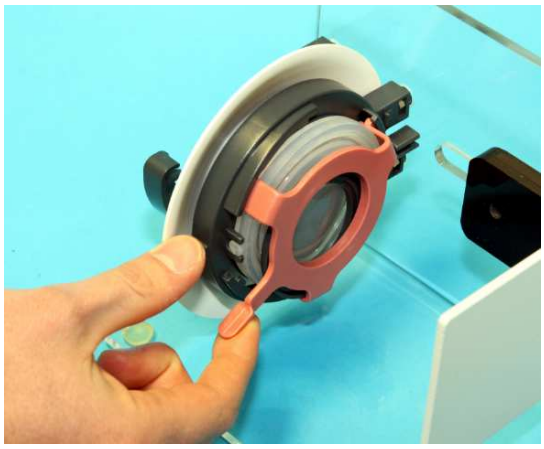
Experiment:
Activate the stress ring and observe the change in shape of the crystalline lens.

Normal eye - Study of accommodation

A normal eye does not need to accommodate when the object is located at a distance of infinity (distant landscape). The image is formed on the retina without any action by the ciliary muscles.When the object is located at a short distance, accommodation is required.

Experiment:
Shine light on the letter positioned at least one metre away from the eye.
The image on the retina is blurred as it is formed behind the retina.
By compressing the perimeter of the crystalline lens using the stress ring, modify its focus until you obtain a sharp image. In order to modify the focus, use only 1 hand with 2 fingers (thumb and forefinger) as shown below:





Normal eye – Study of the Near Point

The closest point that can be seen while remaining sharp (this gets further away with age).

Experiment:
Compress the crystalline lens as much as possible using the stress ring.
Move the lit up letter closer until the image on the retina is sharp. This is the Near Point, the closest point that the eye can see while remaining sharp.

Myopic eye – Correcting a myopic eye

Myopia is an anomaly of the eye wherein the image of a distant object is formed in front of the retina. The eye is too convergent.

Experiment:
Position the retina in the position previously defined thus simulating a Myopic Eye (this position is defined by obtaining a sharp image of a landscape located at a distance of infinity, with the divergent corrective lens).
Focus on a distant landscape through a window (object located at a distance of infinity), without the corrective lens.
The image of the landscape on the retina is blurred as it is formed in front of the retina.
Position the divergent corrective lens F-1000 mm (biconcave lens). The image becomes sharp on the retina.

Hyperopic eye – Correcting a hyperopic eye

Hyperopia is an anomaly of the eye wherein the image of a distant object is formed behind the retina. The eye is not convergent enough.

Experiment:
Position the retina in the position simulating a Hyperopic Eye (this position is defined by obtaining a sharp image of a landscape located at a distance of infinity, with the convergent corrective lens).

Focus on a distant landscape through a window (object located at a distance of infinity), without the corrective lens.
The image of the landscape on the retina is blurred as it is formed behind the retina.
Position the convergent corrective lens F+1000 mm (biconvex lens). The image becomes sharp on the retina.

V – Contact us

This equipment is guaranteed for 2 years. For any questions regarding this product, please contact:

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