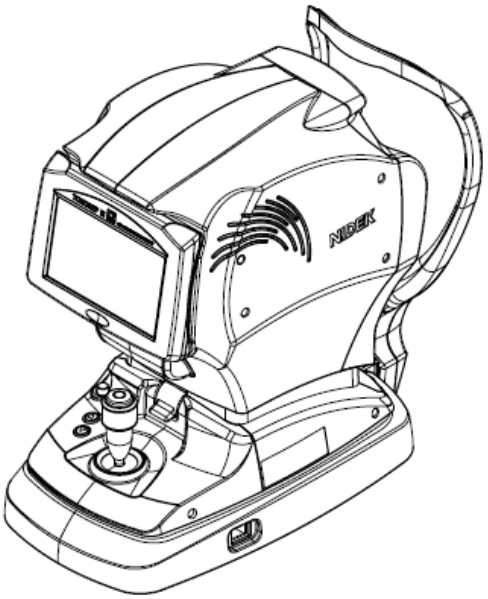
AUTO REF/KERATO/TONO/PACHYMETER

TONOREF III

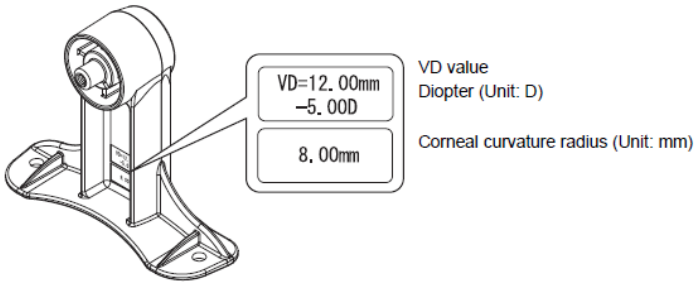


Frequently Asked Questions

Q - What would I use the Tonoref III for?
A - The Tonoref III has four main measurements – Auto-refractor, auto-keratometer, non-contact tonometry and non-contact pachymetry.
It can also measure accommodation, opacity assessment, pupil size, cornea size and PD.

Q - How do you turn on and off the Tonoref III?
A - The power switch is found on the base of the Tonoref III on the RHS. Ensure the locking lever is unlocked during normal use.
The device moves smoothly up, down, forward, backwards, left and right.

Q - How do I check the Tonoref III is measuring correctly?
A - You can use the model eye in the accessory pack to check the refraction and keratometry measurements. The measurements should be as stated on the model eye. Tonometry measurements should also be checked regularly for calibration. Please contact Birmingham Optical if calibration is not correct.



Q - Do I have to write out the information the Tononref III measures?

A - The Tonoref III has an in-built printer – press the '*Print*' icon on the Tonoref III touchscreen  .
Or if configured to do so, the Tonoref III can input information directly into practice management software or other Nidek devices (eg. Phoropters).

Q - How can I change the printer roll?
A - Gently lift the screen and open the cover and replace the printer roll, with the paper coming over the top. Close the cover and restore original screen position.

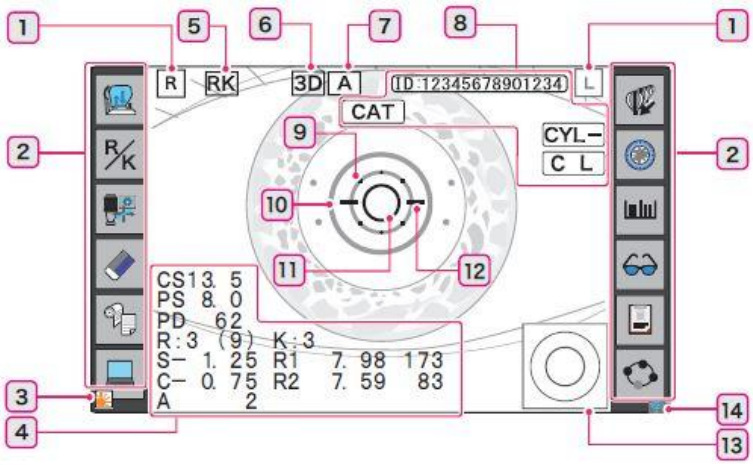
Q - How do you set the date and time?
A - Go to settings, press date and time. Set the date and time and CLOSE to complete the setting.

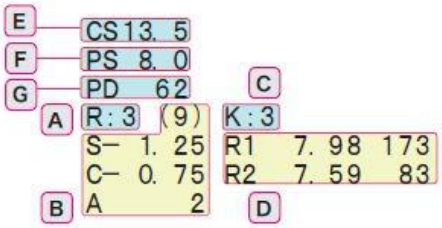
Q - What are the optimal settings to use?

A - For normal use, it is advisable to have the 3D and A buttons displayed along the top of the Tonoref III screen. The Tonoref II will then track the eye in 3 dimensions and capture automatically when correctly aligned.

Q - What do all the icons on the screen mean?

A - There are two modes to the Tonoref III – The '*upper*' mode will measure auto-refraction and keratometry. The '*lower*' mode will measure Pachymetry and Tonometry.

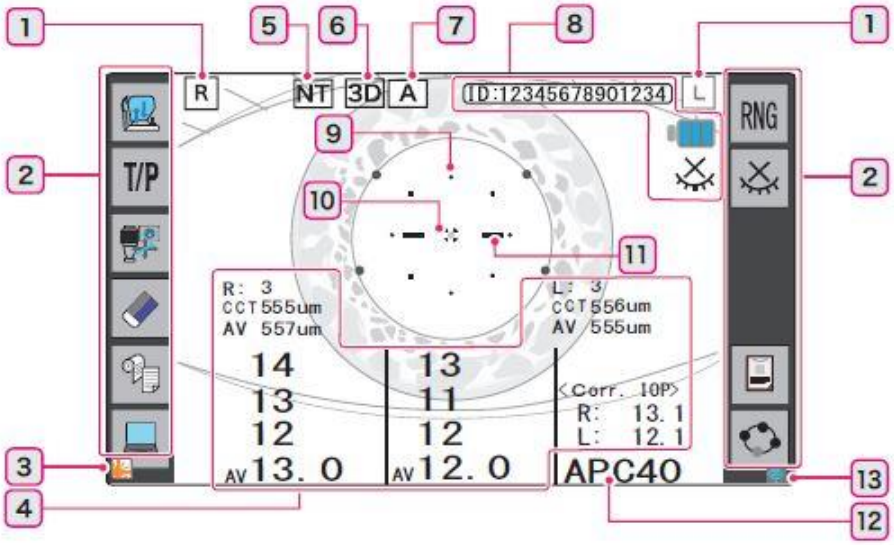


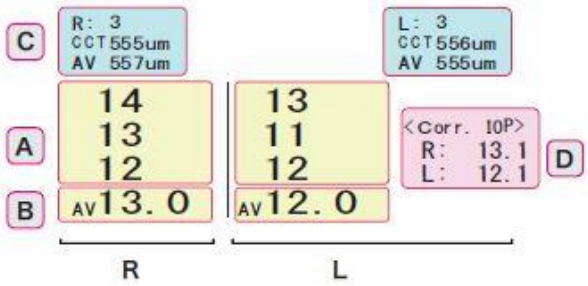


E	[CS]: Corneal Size
F	[PS]: Pupil Size
G	[PD]: Pupillary Distance

A	[R]: Number of AR measurements	C	[K]: Number of KM measurements
B	AR latest values [S]: Spherical refractive error [C]: Cylindrical refractive error [A]: Cylinder axis * The number in parentheses indicates a confidence index.	D	KM latest values [R1]: Corneal curvature radius and axis angle in the flattest meridian direction [R2]: Corneal curvature radius and axis angle in the steepest meridian direction

RKT	Selects measurement mode (RKT successive, RK individual, NT individual)
R/K [R/K]	Selects measurement contents (AR/KM, AR, or KM).
Auto	Selects auto tracking mode ([3D], [2D], OFF) and auto shot mode (ON, OFF).
Clear	Displays a message to confirm whether to clear data. Pressing [OK] in the message clears all the measured data.
Print	Prints the measured results. If there are no measured results, the printer paper is advanced blankly.
Measured value transmission	Transmits the measured values to the connected equipment.
Accommodation measurement	Displays the accommodation measurement screen.
Retroillumination image	Displays the retroillumination image observation screen.
CS/PS/PD	Each press switches from AR or KM measurement to CS → PS → PD measurement.
Vision comparison	Displays the vision comparison screen.





A	NT measurement value Latest three measured values
B	[AV] Average intraocular pressure
C	Pachymetry value [R]: ([L]:) Number of right (left) eye measurements [CCT] Latest measured value [AV] Average value
D	Corrected intraocular pressure value Displayed when the intraocular pressure correction function is activated.

RKT	Selects measurement mode (RKT successive, RK individual, NT individual)
T/P T/P	Selects measurement contents (tonometry/pachymetry, tonometry, pachymetry)
Auto	Selects auto tracking mode ([3D], [2D], OFF) and auto shot mode (ON, OFF).
Clear	Displays a message to confirm whether to clear data. Pressing [OK] in the message clears all the measured data.
Print	Prints the measured results. If there are no measured results, the printer paper is advanced blankly.
Measured value transmission	Transmits the measured values to the connected equipment.
RNG RNG	Changes the NT measurement range among [APC40], [APC60], [40], and [60].
Eyelid detection off	Activates or deactivates the eyelid detection mode.
Summary	Displays the summary screen that shows various measurement values at the same time. *(page 66)*
Menu	Switches from the measurement screen to the Settings screen.

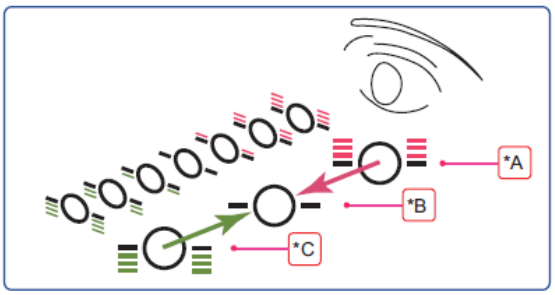
Q - What does the Px see inside the Tonoref III?
A - The fixation target for auto-refraction and keratometry is a hot air balloon at the end of a road.

(Advise the Px the image will go in and out of focus during measurement)
The fixation target for non-contact pachymetry and tonometry is a green dot.

Q - How do you know if you are at the correct position to take measurements?
A - Line up the mire ring and bring the eye into focus. Pink lines above the mire ring mean you are too close to the eye – pull back. Green lines below the mire ring mean you are too far away from the eye – slowly push forward.

Focusing indicator display

For manual focusing, move the joystick forward and backward until the focusing indicator shows the optimum condition (-O-).



*A	Too close to the patient's eye
*B	Optimum focusing condition
*C	Too far from the patient's eye

Q - What happens when the alignment or focusing is not within the working range of the auto tracking?
A - Red arrows will appear indicating which way to move the device to achieve better alignment.

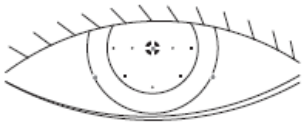
Limit indicators are displayed in each direction of up/down (/), right/left (/), or forward/backward (/).

Q - Can I still take measurements if the Px is blinking?
A - It is possible to manual start the measurements by pressing the button on the joystick.

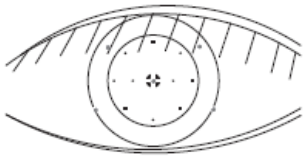
Q - How do you know if the patients' eye is wide enough?

A - There is an eyelid detector .

Q - What if the patient has long eyelashes?
A - If eyelashes or lids obstruct the minimum pupil diameter marker or mire ring, all measurements may be more difficult to achieve. Advice patient to open eyes as wide as possible. If required, ask the Px to hold their lids open (or you can if the Px is happy with this).



Eyelid is over the applanation area.

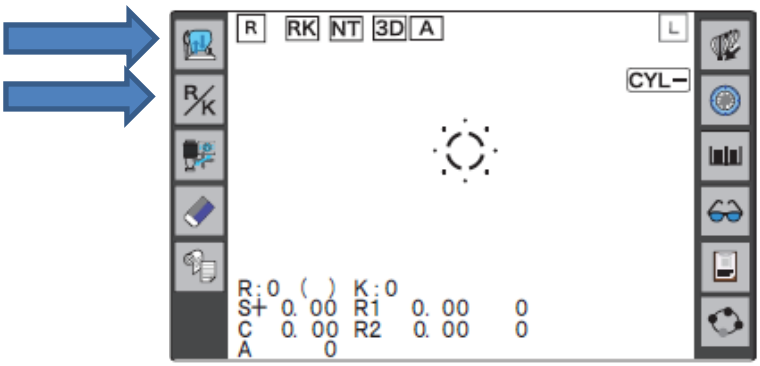


Eyelashes are over the applanation area.

Q - Can you measure tonometry only or do you need to do auto-refractor also?

A - Pressing the  button toggles between the '*upper*' and '*lower*' modes.

Similarly, pressing the  button will allow you to toggle between performing auto-refraction or keratometry, or both in '*upper*' mode. When in '*lower*' mode, press T/P to toggle between pachymetry, tonometry, or both.



Q - Are the IOPs measured after the autorefractor?
A - You can choose to perform either the '*upper*' or '*lower*' modes, or one after the other (see above). Once complete a message '***PULL BACK***' will be displayed on the screen. When pulled back the device automatically lowers ready for tonometry and pachymetry measurements to be performed.

Q - What does 'KM?', 'AR?', 'PACH?', 'NT?' mean?
A - This indicates the Tonoref III has been unable to achieve all required measurements.
Press the button on the joystick to retake the missing measurements. When complete '***FINISH***' appears on screen.

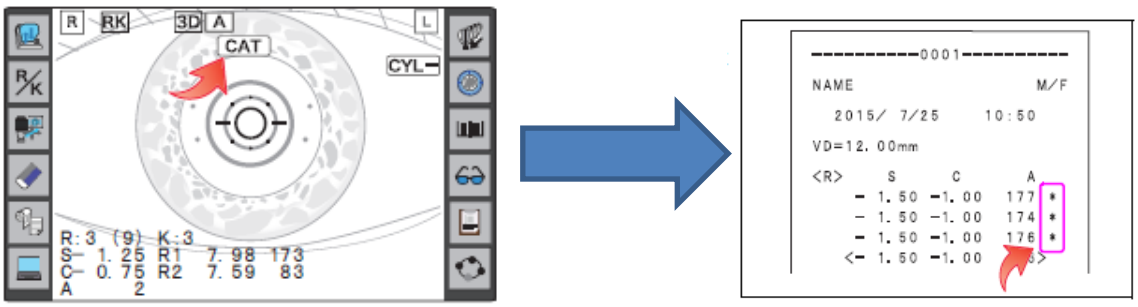
Q - What do the error 'ALM' mean?
A - ALM means alignment error. Check Px positioning and device alignment and try measurement again.

Q - What does the error 'APL' mean?
A - The tonometry measurement has not been successful, possibly due to lids or lashes. Ask the Px to open the eyes wider or hold the lids out of the way if necessary.

Q - What does PS and CS mean?
A - PS = Pupil size and CS = corneal size. These are measured automatically during auto-refraction.

Q - How do you know when the measurements are completed?
A - '***FINISH***' will be displayed on the screen. You can then move onto the next measurement or print the results.

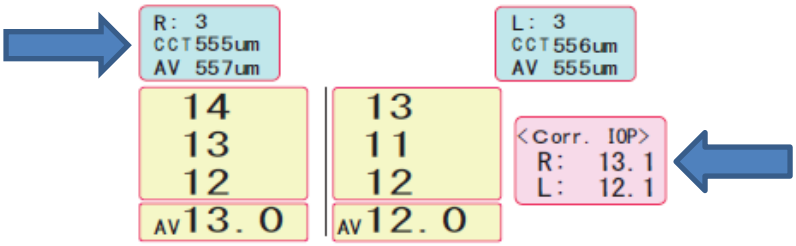
Q - How do I know if the measurements have been taken in 'cataract' mode?
A - '***CAT***' is displayed on the screen and an asterisk will be displayed on the printout when cataract makes the measurements difficult or unreliable.



Q - Why does Keratometry have 2 separate readings on the printout?
A - The measurement of KM is one using a 'double kerato ring.' The outside ring measures 3.3mm and inside measures 2.4mm. The measurements are displayed for each of these rings.

Q - Can I measure hard contact lenses?
A - Yes, use the contact lens holder which is incorporated in the spherical model eye.

Q - What does CCT mean?
A - Central Corneal Thickness – Pachymetry values



This is measured just before tonometry measurements are taken. This allows calculation of the '*corrected IOPs'* to take place based upon the measured pachymetry and tonometry values.
On occasions the device may not take the measurement if the patient blinks, indicated by '*BLK*'.
Repeat measurement process so full measurements are acquired.

Q - What strength of puff should I have the Tonoref III set to?
A - APC40 is the normal setting. This allows the most comfortable puff of air for the Px (see table below and adjust as necessary using RNG button).

Measurement range	Guide for selection	Air pressure control
[APC40]	Normal	Air pressure peak is automatically controlled in the range of 1 to 40 mmHg.
[APC60]	Intraocular pressure is 40 mmHg or more.	Air pressure peak is automatically controlled in the range of 1 to 60 mmHg.
[40]	Intraocular pressure fluctuates substantially.	Air pressure peak is fixed in the range of 1 to 40 mmHg.
[60]	Intraocular pressure is 40 mmHg or more and it fluctuates substantially.	Air pressure peak is fixed in the range of 1 to 60 mmHg.

Q - How do you clean the Tonoref III?
A - Use the dust blower to remove any dust from the measuring window and air nozzle. Use a dry microfibre cloth to gently clean the external area.
When the PARAMETER:
OTHER> WINDOW CHECK is set to (YES or (DAY) the measure window cleanliness will be checked at the device start up.

Q - How do you shut down the Tonoref III?
A - Line the device up and press down on the central lock. Power off the Tonoref III using the switch on the RHS of the base and put the dust cover on.