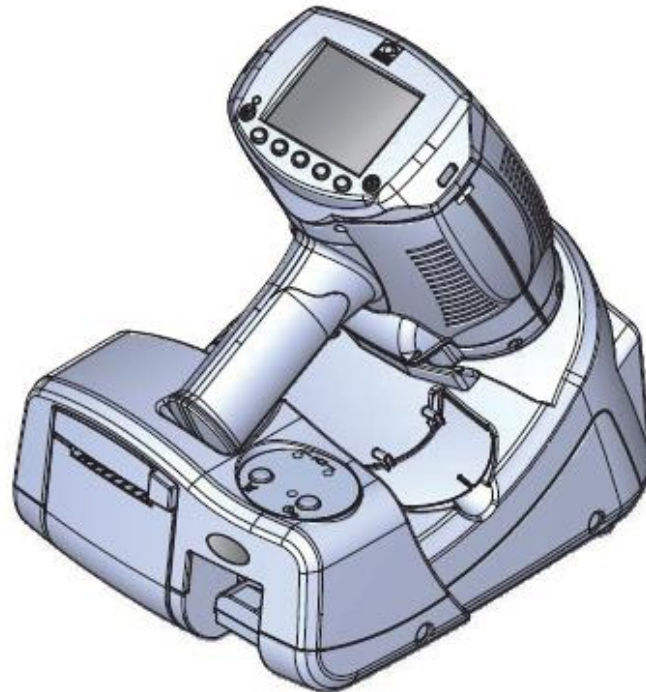# HANDHELD REF/KERATOMETER
HandyRef-K

Quick guide

The Nidek HandyRef-K is a handheld device which gives auto-refraction and Keratometry measurements of a person's eye. It has a 3.5-inch colour LCD screen, auto-shot mode and can measure a spherical range of -20.00D to +20.00D and Cyl 0 to +/- 12D. The new measurement method 'synchro scan technology' measurement starts when the alignment starts. This provides a more stable measurement value more effectively and efficiently. Auto-refraction and Keratometry normally lasts a few seconds.

Operating procedure

When fully charged, press the START button When Initialising is complete, the main screen is displayed.
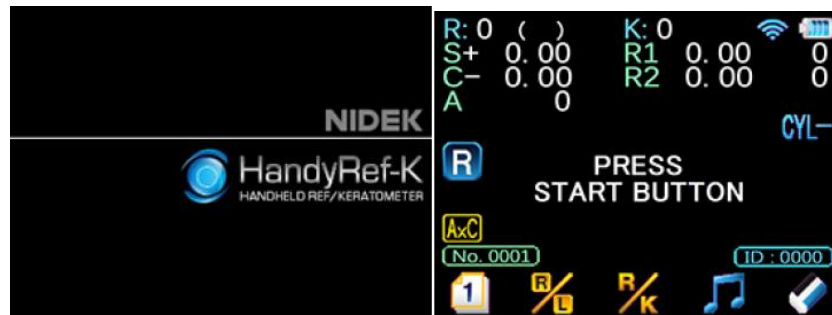
Press to cycle through the measurement modes – Auto-refraction, Keratometry or both.

Select Right or Left eye manually using or the HandyRef-K can detect automatically.

Release the forehead rest if you wish to use it to aid stability during measurement. It is also advisable to place your hand on the HandyRef-K and the patient's forehead to aid stability.

Instruct the patient to remove their glasses. Position the patient in a chair and if possible, with their head resting back against a headrest. Give the patient the instructions:

'Look inside the HandyRef-K at the hot air balloon at the end of the road. The image will go in and out of focus during measurement. Try not to blink during measurement and keep both eyes as wide open as you can.'

Press the trigger button on the handle of the HandyRef-K and align the device with the patient's eye, holding the main body as level as possible (NB there is an axis correction setting which will compensate for any deviations – it is advisable to keep this setting on. **AxC** will be displayed on screen when active).
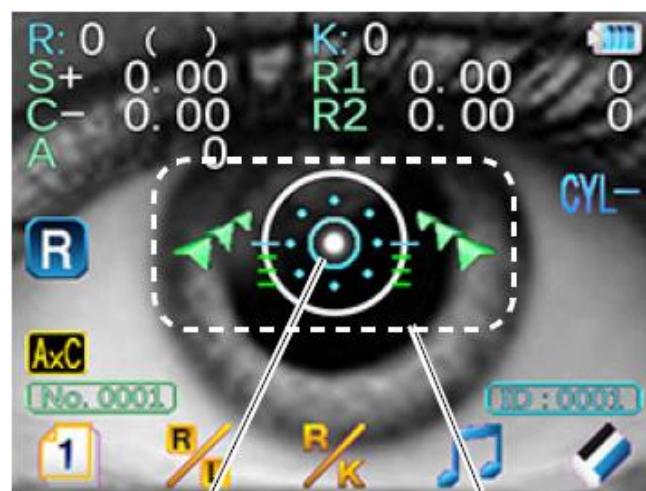

A minimum pupil size of 2mm is required for accurate results

Minimum pupil diameter mark

Ensure the room illumination / sunlight is not reflecting from the cornea, or directly into the HandyRef-K aperture. Darken the room if required.
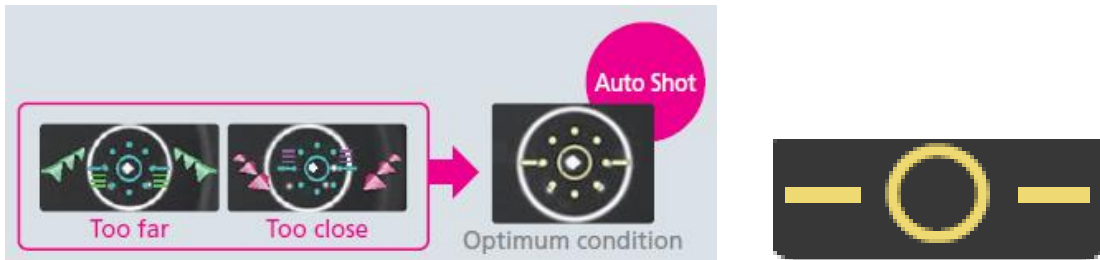
Whilst looking at the patient's eye on screen, move the HandyRef-K closer to the eye.

Alignment guide mark   Focusing indicator

The focusing indicator to tell you if you are too close or too far from alignment:


When aligned the indicator marker turns yellow. Measurement begins automatically with auto shot once alignment and focus is achieved. Keratometry measurement occurs first with auto-refraction after. When all readings are complete, 《FINISH》 is displayed on screen. Move the HandyRef-K to the second eye and repeat for second eye.

Once all measurements are completed, results can be printed (if required):

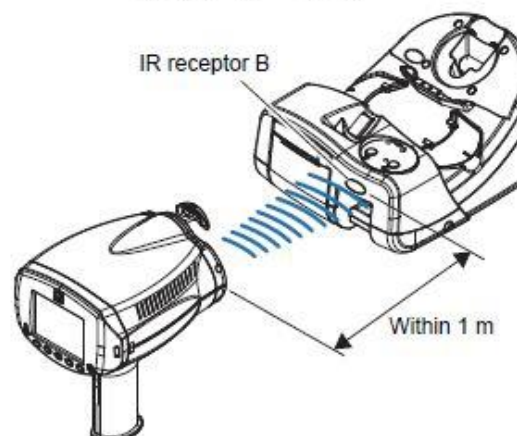● Place the main body on the station, then press .

Placing the main body on the station offers more stable communication.

Main body re-ceptacle
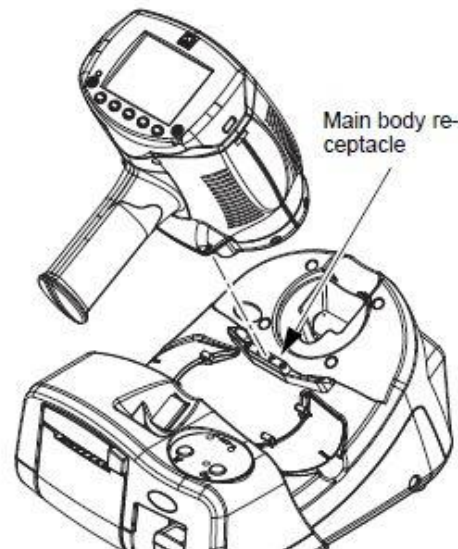
● Aim the main body toward the IR receptor B of the station, then press .

The maximum communication distance between the main body and station is 1 m.

IR receptor B

Within 1 m

Troubleshooting

If **'AR?' or 'KM?'** appears on screen following measurement, it indicates the HandyRef-K has not been able to capture the required number of readings. This is usually due to the patient blinking or moving their eyes during measurement. Press the button on the handle whilst still in position to obtain the remaining measurements.

If **'Err BLK'** appears on screen following measurement, it indicates measurement has not been possible due to Px blinking. Ask the Px to open their eyes wider during measurement.

If **'Err CONF'** appears on screen following measurement, it indicates measurement has a low confidence rating due to corneal distortion, for example (Only for AR measurements).

If measurement is difficult or not possible due to cataract, the HandyRef-K will

automatically change to the cataract measurement mode as indicated by on the display. This will also be indicated on the printout by an *. (Please note measurements are likely to have more variability in 'CAT' mode).

Additional Functions

The HandyRef-K has several additional features. These are accessible by cycling through the 'pages' of the HandyRef-K screen (see screens below).

The melody function is useful for inexperienced patients, children, and anxious patients to aid concentration into the aperture of the HandyRef-K.

Pupil size is measured automatically during the AR (autorefraction) measurement. It can

also be measured manually using .

Retro illumination enables the observation of any opacity within the optical media. The last captured image is saved.

By tilting the instrument 60° or more downward, the HandyRef-K will adjust for supine measurement. Measurements can be taken at 180° or 90° to the Px head position. Change

the measurement direction by using .

By holding the button on the handle for more than a second, the HandyRef-K will enter

'QUICK' mode. This allows measurements to be taken on more difficult eyes. **QK** is displayed. Please note the focus indicator is not displayed. Measurements may be less reliable than in standing measurement mode.

| Page 1	Operation icons	Function
	1 [Page 1]	Displays Page 2.
	R/L [R/L]	Selects the patient's eye manually.
	R/K [R/K]	Selects measurement mode (AR/KM, AR, or KM).
	[Melody]	Turns on or off the melody. A melody is played to hold a child's attention during measurement. The melody stops when the print button is pressed or clearing data is complete. However, when the "SUMMARY" parameter is set to "YES", the melody does not stop even when the print button is pressed. Press again to stop the melody.
	[Clear]	Holding down the button for about a second erases all the measured data.

Page 2	Operation icons	Function
	2 [Page 2]	Displays Page 3.
	[Pupil Size]	Displays the pupil size measurement screen.
	[Sagittal]	Displays the sagittal measurement screen.
	O [Ring image]	Display the ring image screen.
	[Retroillumination image]	Displays the retroillumination image observation screen.

Page 3	Operation icons	Function
	3 [Page 3]	Displays Page 1.
	[Supine position]	Changes the direction in supine position mode.
	[Memory]	Displays the memory data screen.
	[CYL]	Changes CYL mode.
	[Parameter]	Displays the parameter screen when held down for more than a second.

Calibration / measurement accuracy check of the HandyRef-K should only need to be performed once every 6 months in routine use, but calibration is advised if you are getting variability in measurements. If the values differ substantially from the values marked on the model eye, contact Birmingham Optical Group Support team.

1 Stand the spherical model eye with its lens facing up in the spherical model eye measuring holder.

2 Place the main body on the station.

3 Set the following parameters as shown below:

Parameter option	Setting
" 1. AR STEP" (Refractive power measurement increments)	0.12D
" 11. KM UNIT" (Display unit of corneal curvature radius)	mm
" 12. KM DISPLAY" (Corneal curvature radius measurement display)	R1, R2
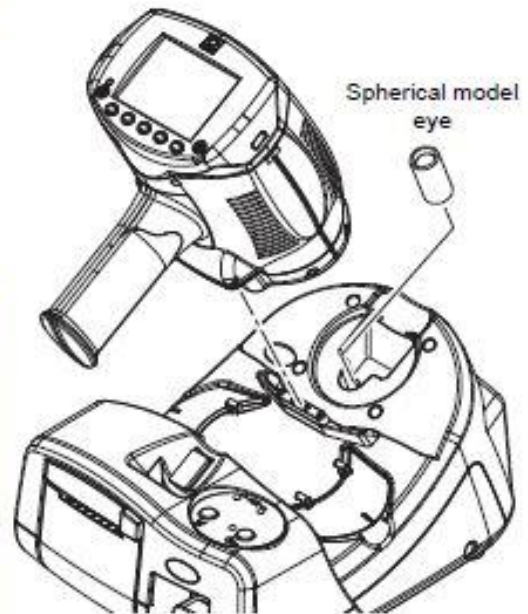
4 Press R/L to select the eye to be measured.

Confirm that the **R** or **L** indication changes to **m·R** or **m·L**.

Either eye (R/L) may be selected.