



Auto Ref/Keratometer **ARK-F**
Auto Refractometer **AR-F**



More comfortable,
more seamless
for anyone





Reliably accurate eye examination equipment with comfortable operability has become worldwide standard. It is used every day; that's why NIDEK stands behind it with complete dedication and professionalism. Our ARK-F/AR-F impressively changes your "standard" with its smooth, fully-automated and precise measurement and high freedom of installation, in addition to the conventional accurate measurement.

Advanced operation

Remarkably easy workflow through fully-automated measurement

Simply by placing the chin on the chinrest, NIDEK eye detection camera automatically detects the position of the eyes and measurement starts without pressing any button. Gentle voice guidance (available in 9 languages) facilitates smooth measurement for any operator.



No direct operation required

1 "Measurement starting. Please keep your hands away from the device."



A patient places chin on the chinrest. The device automatically detects the position of the eyes and eye level.





2
"Please open your eyes wide."



3
"Measurement finished."

The measuring unit automatically moves to the measuring position with the screen changing to the patient's eye image and measurement starts. The device then moves to the opposite eye and repeats the procedure.

When measured values for the left and right eyes are obtained, measurement ends. After the measurement, data output (printing or exporting to external devices) can be performed automatically.

Advanced features of fully-automated measurement

1 Automated eye detection

For automated detection of the eyes, the NIDEK eye detection camera (NEDC) is incorporated into the device. Once the patient is properly positioned on the chinrest, the NEDC automatically detects the eyes allowing for precise alignment and measurement. This unique detection and positioning system enables a "complete" fully-automated measurement process that increases patient and operator comfort.

3 Easier eyelid support

The fully-automated measurement and the tilt and swivel functions of the screen allow easier access to the patients' eyelids compared to the conventional units.



2 9 languages for gentle voice guidance

For fully-automated measurements, the ARK-F/AR-F includes 9 languages for voice guidance. This acts as a bridge between your staff and patients with language barriers to facilitate accurate and directed communication for a smooth measurement process.

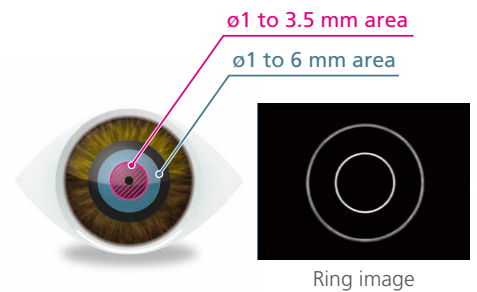




Accurate measurement

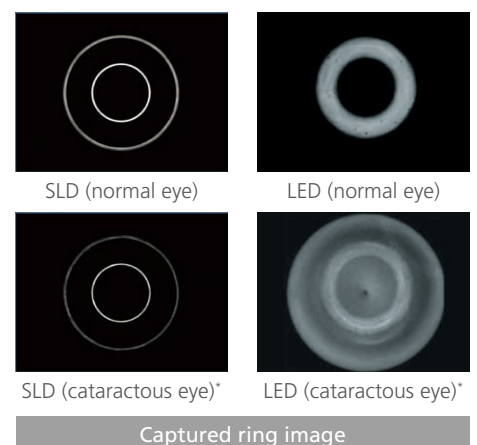
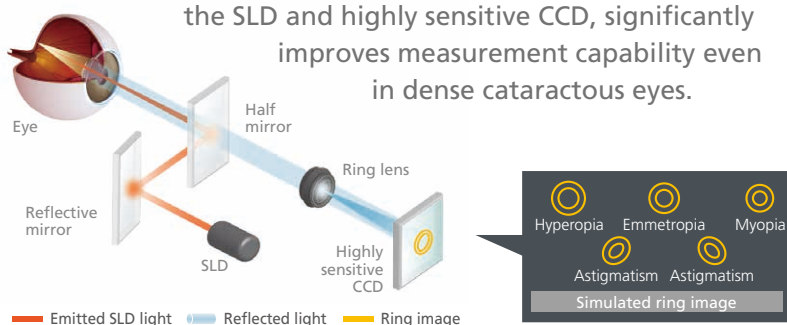
Large pupil zone imaging method

The large pupil zone imaging method enables the measurement of wider area refraction up to 6 mm diameter and can indicate the difference between the wide area refraction and central area refraction of up to 3.5 mm diameter. These pupil diameters are measured simultaneously. The difference of the measurement allows assessment of the effect of pupil size such as a vision in dim light.



Super luminescent diode and highly sensitive CCD

Incorporation of the super luminescent diode (SLD) provides a sharper and clearer image compared to a conventional LED. The highly sensitive CCD detects the ring image even if the fundus reflection is weak. The system, which combines the SLD and highly sensitive CCD, significantly improves measurement capability even in dense cataractous eyes.



*In-house data of a cataractous model eye



Optimal fogging to minimize accommodation

Fogging is performed after correcting the patient's astigmatism with built-in cylinder lenses. This allows the patient to view the target clearly and minimizes the interference with accommodation even in high astigmatism.

Keratometry measurement with mire ring (available for the ARK-F)

The mire ring is used to measure keratometry. It reduces eyelid artifacts.



Measurement with mire ring



Quick shot mode*

Quick shot mode may be beneficial for children or others, who have difficulty holding their eyes steady during an examination.

*Quick shot mode is for reference.

CS*, PS, and PD measurement

CS (corneal size), PS (pupil size), and PD (pupillary distance) values can be measured manually based on eye images.

*Available for the ARK-F

Flexible and space-saving design

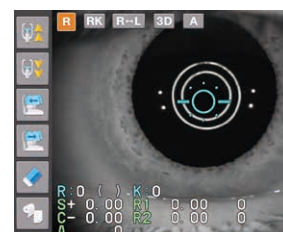
Large tilt and swivel monitor

Since the screen can be freely tilted and swiveled, the ARK-F/AR-F can be placed anywhere in an examination area; installation against a wall or in a corner of the room is now possible. The conventional face-to-face position is available, and is designed to provide excellent patient comfort. Freedom of operator mobility even enables the support of a patient's eyelids during measurement. Flexible layout and space-saving design contribute to improved productivity and efficiency.



Selectable and intuitive manual operation

Manual measurement with the touch screen can also be performed with the ARK-F/AR-F. Simply selecting and holding a position on-screen and an icon allows alignment. For greater operator flexibility and enhanced productivity, optional hand-held control, tablet software and joystick are available.





A variety of options to meet your needs

■ Hand-held control (wired/wireless)

Ergonomically designed palm-fit controller offers an all-new handling experience. Simple and well-organized button layout provides excellent single-handed operation. It can be stored in a dedicated holder which can be attached to either side of the ARK-F/AR-F.



Wireless type of hand-held control

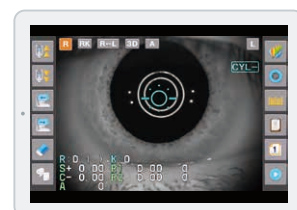
■ Joystick

Models are available with or without a joystick. The 4-direction button of the newly-designed joystick allows smooth movement of the measuring unit forward, backward, right, or left.



■ Tablet control software

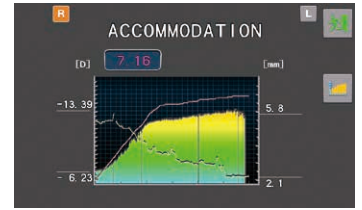
When using a tablet as a controller, the screen of the ARK-F/AR-F is duplicated on the tablet screen. It is even possible to measure with the same accuracy and comfort from a remote location.



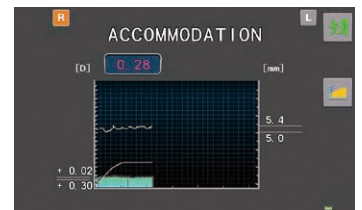
Practical and user-friendly features

Patient-friendly accommodation measurement

Objective measurement of accommodation is performed with the patient focusing on a target that moves from distant to near. Intelligent algorithm detects the patient response and reduces the measurement time in cases with a slow or weak accommodative response. The accommodation measurement helps to assess pseudomyopia, eyestrain, and accommodative palsy.



Emmetropia



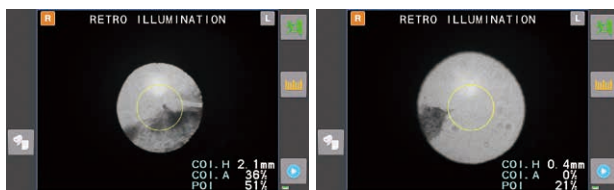
Presbyopia

Retroillumination image and NIDEK cataract indices

The retroillumination image enables the observation of opacity of the optical media of the eye. NIDEK cataract indices indicate the severity of the opacity and help to assess the progression of pathology.

COI.H	Opacity size within a diameter of 3 mm of the center (vertical diameter): mm
COI.A	Opacity proportion within a diameter of 3 mm of the center: %
POI	Opacity proportion within the entire periphery: %

Cataract indices



Eye with dense opacity

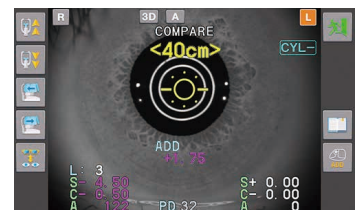
Eye with light opacity

The NIDEK cataract indices are for reference only. The following conditions may indicate different indices from ones of actual status.

- ✓ Peripheral image is darkly captured due to alignment position.
- ✓ Opacities are not in focus.
- ✓ Bright spot reflecting observation light occurs on the cornea apex.
- ✓ Position of the 3 mm diameter circle is shifted due to incorrect pupil detection caused by opacity location.

Recall function for instant vision comparisons

The recall function provides the instant comparison between vision corrected with AR data and uncorrected vision or vision corrected with the data of patient's own glasses. For the patient, this function demonstrates the difference in vision and the necessity for more appropriate vision correction.



Distance vision corrected with AR data	Uncorrected distance vision
	Distance vision corrected with LM data*
Near vision corrected with AR data	Uncorrected near vision
	Near vision corrected with LM data*

Vision comparisons

*The data of patient's own glasses has to be imported from a NIDEK lensmeter.

ID:	ALL	AR	KM	CS	PS	ACC	RETRO	EyeC
<R>	R1	R2	deg	<L>	R1	R2	deg	
	(e:3.3)				(e:3.3)			
1	8.24	8.20	163	1	8.30	8.20	4	
2	8.24	8.19	167	2	8.30	8.21	3	
3	8.25	8.21	0	3	8.29	8.20	4	
4	8.24	8.20	169	4	8.30	8.21	4	
5	8.25	8.20	169	5	8.30	8.21	3	
6	8.24	8.20	167	6	8.30	8.20	3	
7	8.24	8.20	166	7	8.29	8.20	3	
	8.24	8.20	167	8	8.30	8.20	3	

Summary display

Summary display and printout of measured values

Various measured values can be displayed simultaneously on the summary screen allowing easy and quick confirmation and printing. Measured data can be exported to the NIDEK refractor or a connected computer.



ID	12245678901234567890
NAME	2018/ 1/1 10:00 M/F
VD=12.00mm	
WD=40.00	
REF. INDEX = 1.5375	
C<D> S C A	
-1.75	-0.50 173 9
-1.25	-1.00 177 9
-1.25	-1.00 15 9
<- 2.00 SE	>
C<L> SIZE HARD B.C.	
R.B	7.90
NIDEK	SOFT 8.50
13.5	8.50

Printout example

High-speed printer with easy loading and auto cutter

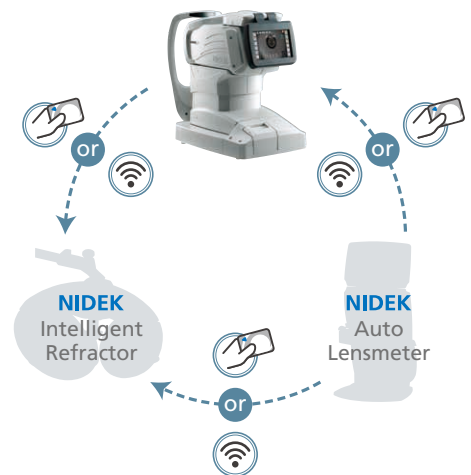
Printer paper can be changed easily. The data sheet is cut by the auto cutter for quick and easy detachment.

Network configuration with high flexibility

Quick and easy wireless data transfer

NIDEK refraction products allow for quick and easy wireless data transfer* using the Eye Care card, WLAN or infrared communication. This is helpful for making a simple refraction system without complicated wired connection.

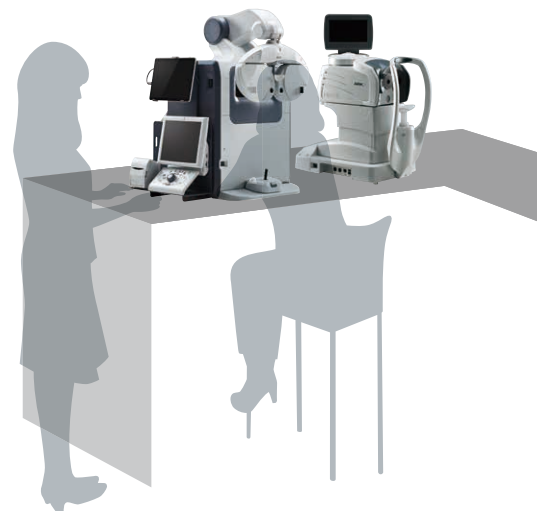
*The specifications for wireless data transfer differ according to each product and from country to country. The requirements also differ depending on the method of wireless data transfer.



This configuration is just an example.

Where machines thrive, eyecare professionals shine

By incorporating the NIDEK Tabletop Refraction System TS-610 with the Fully Assisted Refraction System (FARS)* into your practice, you can attribute much of the refraction process to your devices with a space-saving device layout. Staff and patients will appreciate the enhanced comfort and speed of automation and technology, while eyecare professionals will have more patient time for other value added examinations and patient discussions.



*The TS-610 is used for subjective refractions and integrates the chart and refractor into a single unit in an innovative, compact design. The FARS, an optional kit for the TS-610, is used to determine the full refractive correction based on patient response using objective data or spectacle prescription as the starting point.

ARK-F/AR-F Specifications

Auto refractometer Measurement range	Sphere -30.00 to +25.00 D (VD = 12 mm) (0.01/0.12/0.25 D increments) Cylinder 0 to ±12.00 D (0.01/0.12/0.25 D increments) Axis 0 to 180° (1°/5° increments)
Minimum measurable pupil diameter	ø2 mm
Auto keratometer*1 Measurement range	Curvature radius 5.00 to 13.00 mm (0.01 mm increments) Refractive power 25.96 to 67.50 D (n = 1.3375) (0.01/0.12/0.25 D increments) Cylindrical power 0 to ±12.00 D (0.01/0.12/0.25 D increments) Axis 0 to 180° (1°/5° increments)
Sagittal measurement	25° each from the center (superior side, inferior side, temporal side, nasal side)
Vision comparison	Available with scenery chart
Retroillumination image	Available
Accommodation measurement range	0 to 10.00 D (0.01/0.12/0.25 D increments)
Pupillary distance measurement range	30 to 85 mm (1 mm increments) (Near point PD: 28 to 80 mm at WD = 40 cm)
Corneal size measurement range*1	10.0 to 14.0 mm (0.1 mm increments)
Pupil size measurement range	1.0 to 10.0 mm (0.1 mm increments)
Auto tracking	Fully-automated 3D tracking (X-Y-Z directions)
Auto shot	Available
Auto measurement	Start automatically after eye detection
Auto transition from right to left eye measurement	Available
Display	7.0-inch touch color LCD with tilt and swivel functions
Printer	Thermal line printer with easy loading and auto cutter
Interface	RS-232C: 2 ports USB: 2 ports LAN: 1 port Wireless LAN (WLAN)*2: 1ch (Type A and B only)
Power supply	100 to 240 V AC, 50/60 Hz
Power consumption	100 VA
Dimensions/mass	305 (W) x 492 (D) x 488 (H) mm / 20 kg 12.0 (W) x 19.4 (D) x 19.2 (H) " / 44 lbs.
Standard accessories	Printer paper, Power cord, Dust cover, Chinrest paper, Fixing pins for chinrest paper, Spherical model eye with integrated contact lens holder*3
Optional accessories	Communication cable (RS-232C), Eye Care card, Hand-held control (wired or wireless type), Joystick*4, Tablet control software*4, Wireless LAN*4

*1 Available for the ARK-F

*2 Only for the countries (regions) certified by the Radio Law

*3 The integrated contact lens holder is used only with the ARK-F.

*4 Only available as a factory setting that cannot be added later

Product/model name: AUTO REF/KERATOMETER ARK-F
AUTO REFRACTOMETER AR-F

Brochure and listed features of the devices are intended for non-US practitioners.

Specifications may vary depending on circumstances in each country.

Specifications and design are subject to change without notice.

The tablet described in this brochure is not included or sold with the ARK-F/AR-F.

