

Marco **AUTO REFRACTORS AND KERATOMETERS**



ARK-Series COMPARISON



User-Friendly Design
Tiltable Color 6.5" LCD Screen
































































"Marco Connect" enables the use of
EMR cards or wireless data transfer



High Speed Printer with easy loading
and auto cutter

ARK-Series PRODUCTS

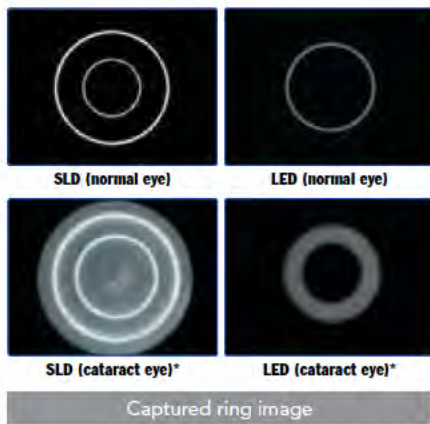
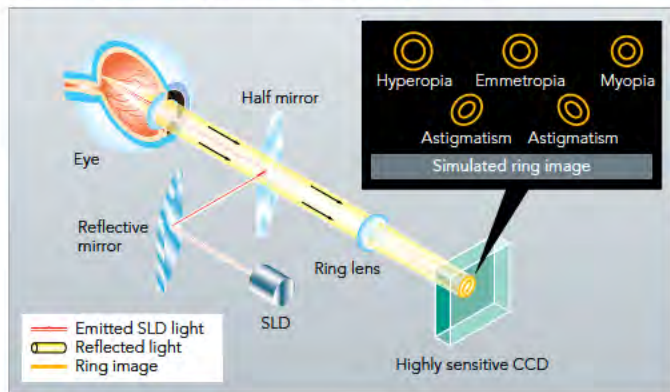
FEATURES	 HandyRef-K	 M3 ARK	 ARK-1a	 ARK-1s
Automatic				
Super Luminescent Diode Technology				
Measurable Range -20D to +25D/Cyl OD to ±12D				
Scenery Balloon Target Chart				
"Marco Connect" EMR Internet Capability				
Hand Held Portable Unit				
Automatic "Eye Tracking" Technology Y				
Automatic "Eye Tracking" Technology X, Y, Z				
Continuous Measurement				
Minimum Pupil Diameter 2.0mm				
Measurable Range -30D to +25D/Cyl OD to ±12D				
Rotary Prism Technology				
Non-Contact Tonometry				
Peripheral Spherical Power -15 to +15D				
Peripheral Cylindrical Power OD to 6D				
Auto Pupil Size Measurement 1.0 to 10.0 mm				
Auto Corneal Size Measurement 10.0 to 14.0 mm				
Dual Zone Measurement				
Accommodation Measurement				
Retro-Illumination				
Low Contrast Testing				
Glare Testing				
Visual Acuity Chart				
Subjective Spherical Refinement				
Compare Glasses vs. AR Reading				
Unaided Vision vs. AR Reading				
Near Vision Testing				

ARK-Series

INTELLIGENT TECHNOLOGIES

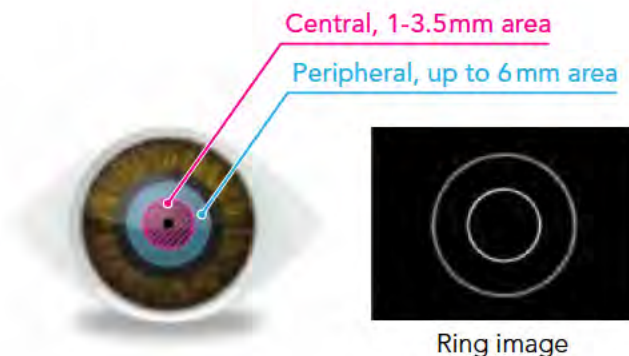
The Marco **ARK-Series** delivers the best combination of automated technology today for rapid testing, controlled for accommodation and a precise way to measure small and large pupils especially on eyes with media opacities.

Super Luminescent Diode (SLD) is an edge-emitting semiconductor light source based on super luminescence. It utilizes the high power and brightness of laser diodes providing a sharper image compared to LED. This measures patients, quickly and accurately, with cataracts, corneal opacities, IOLs, and post LASIK.



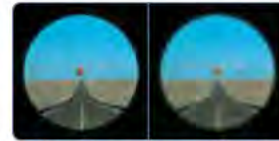
* In-house data of a cataractous model eye

Exclusive Dual Zone Refractive Measurement Utilizing Double-Ring technology to measure two pupil zones supplies information based on pupil size and provides more robust objective data as a starting point for subjective refractions.

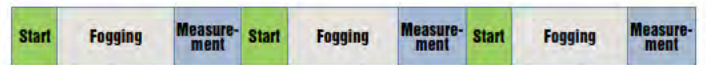


Automatic Fogging and High-Speed Measurements:

The ARK-Series automatic fogging minimizes accommodation and maintains fog throughout all distance measurement readings. This saves valuable time and is ideal for children and patients who find it difficult to fixate.



Balloon Target Fogged Target

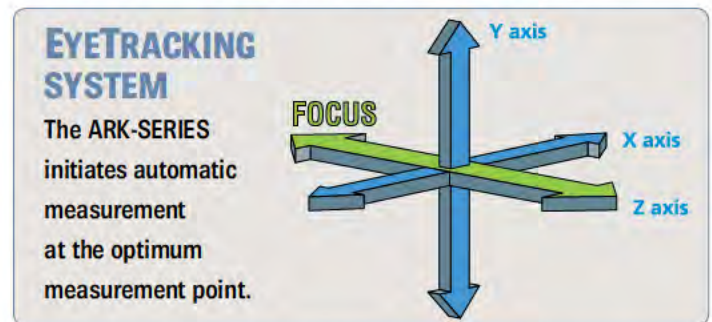


Conventional auto refractors employ a repeating sequence of fogging and measurement.



The ARK-SERIES maintains fogging throughout multiple measurements.

The EyeTracking System provides X, Y, Z axes tracking (ARK-1s and ARK-1a only) for superior alignment, and focusing.



Confidence Index for each measurement helps to further clarify the reliability of the data obtained and automatic pupil and cornea size is measured with all the ARK-1 Series.

A The confidence index number can range from (3) to (9). This gives the operator an indication of the clarity and quality of the ocular media. A (9) means the data is very repeatable and consistent. A (6) or below indicates that something is going on with the eye.

B PS stands for Pupil Size and CS stands for Corneal Size, both of which are taken automatically.



UNIQUE FEATURES

The **ARK-Series** offers a suite of testing that allows you to drive higher levels of accuracy, efficiency, and enhanced patient flow. The glare testing capability takes questionable accuracy out of the equation and is less cumbersome for the patient.

Glare Testing (ARK-1s only)

Simulates real life glare situations to evaluate your patients' cataracts.



Vision with glare and halo



Normal vision

Simulated patient vision of VA chart and glare source

Low Contrast Testing (ARK-1s only)

Gives the ability to determine whether low contrast situations diminish a patient's acuity.

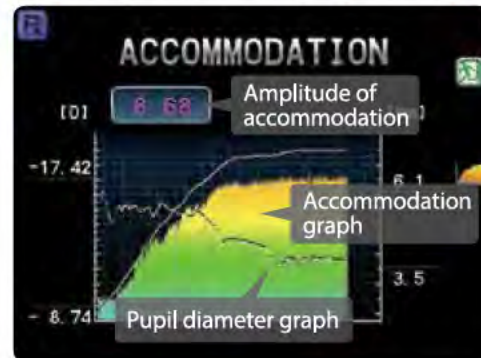


Simulated patient's vision of low contrast VA chart

Accommodation Testing (ARK-1s and ARK-1a)

Graphs the accommodation on patients especially with pre-

presbyopia symptoms, latent hyperopia and children that may have difficulty with reading.



Retro-illumination

(ARK-1s, ARK-1a and HandyRef-K)

Illustrates media opacity in both the cornea and lens.



Visual Acuity Chart gives the Practitioner the ability to: (ARK-1s only)

- Subjectively refine sphere
- Compare LM and AR results

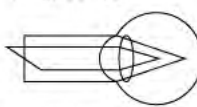
And measure:

- Uncorrected distance vision
- Uncorrected near vision
- Distance vision corrected with AR
- Near vision corrected with AR



SAMPLE PRINTOUTS

Measurement values are printed out using a high-speed printer. Contact lens data can be included, as can eyeprint illustrations to aid in explaining myopia, hyperopia or astigmatism to the patient.

1	-----0002-----
2	ID 12345678901234567890
3	NAME M/F
4	FEB/28/2013 16:10
5	VD=13.75mm
6	WD=16inch
7	<R> S C A
8	- 1.75 - 0.50 173 9
9	- 1.25 - 1.00 177 9
10	- 1.25 - 1.00 5 8
11	<- 1.25 - 1.00 177>
12	<- 2.00 SE >
13	
14	TL - 1.25 - 1.00 177
15	CL - 1.25 - 1.00 177
16	- 1.75 SE
17	L. DATA
18	- 1.50 - 1.00 177
19	PS 4.5
20	ACC 0.50
21	MIN- 1.75 MAX- 2.25
22	(PS MIN 4.6 MAX 5.5)
23	<L> S C A
24	- 1.25 - 1.00 177 9
25	PD 63 N 59
26	<R> mm D deg
27	<R1 7.98 42.25 174>
28	<R2 7.65 44.00 84>
29	<AVG 7.82 43.25 >
30	<CYL -1.75 174>
31	CS 12.5
32	<R> mm D deg
33	<AVG 7.82 43.25 >
34	<CYL -1.75 174>
35	CS 12.5
36	=====
37	NIDEK ARK-1s

1	Patient ID Patient ID scanned by the optional barcode scanner or magnetic card reader
2	Vertex distance
3	Near working distance
4	AR-measured values (center) S: Spherical refractive error C: Cylindrical refractive error A: Cylinder axis
5	Confidence index
6	AR median values
7	Spherical equivalent value
8	Printing of eye diagram
9	Thin lens data
10	Contact lens conversion value
11	AR large area measured values
12	PS (Pupil Size) measured value When measurement is performed with the chart-illuminating lamp turned off during manual PS measurement, "(LAMP=OFF)" is printed out.
13	Accommodation measured values MIN: AR-measured minimum value MAX: AR-measured maximum value (PS MIN: Pupil size minimum value, MAX: Pupil size maximum value) An accommodation graph is printed out depending on the "58.ACC GRAPH PRINT" parameter setting.
14	PD (Pupillary Distance) Distance PD, monocular PD, near PD
15	KM median values R1: Flattest meridian R2: Steepest meridian deg: Corneal cylinder axis AVG: Average of R1 and R2 CYL: Corneal cylindrical error
16	CS (Corneal Size) measured value
17	Comments: Characters and symbols can be freely entered.

1	-----0003-----
2	NAME M/F
3	FEB/28/2013 10:50
4	WD=16inch
5	<R> S C A
6	- 1.50 - 1.00 177 9
7	- 1.50 - 1.00 174 9
8	- 1.50 - 1.00 176 9
9	<- 1.50 - 1.00 176>
10	L. DATA
11	- 1.50 - 1.00 177
12	<L> S C A
13	- 2.50 - 1.00 177 9
14	- 2.50 - 1.00 174 9
15	- 2.50 - 1.00 176 9
16	<- 2.50 - 1.00 176>
17	L. DATA
18	- 1.50 - 1.00 177
19	PD 65
20	UCVA (R 25 L 40)
21	SUBJ
22	R - 1.75 - 1.00 176
23	L - 2.75 - 1.00 176
24	BCVA (R 25 L 25)
25	LOW (R 30 L 30)
26	GLARE (R 40 L 30)
27	ADD
28	R + 2.00 VA 30 WD35
29	L + 2.00 VA 30 WD35
30	LM
31	R - 1.50 -1.00 177
32	L - 2.50 -1.00 176
33	LM ADD
34	R + 2.00 + 2.50
35	L + 2.00 + 2.50
36	<R> mm D deg
37	<R1 7.98 42.25 174>
38	<R2 7.65 44.00 84>
39	<AVG 7.82 43.25 >
40	<CYL -1.75 174>
41	CS 12.5
42	<L> mm D deg
43	<R1 7.98 42.25 174>
44	<R2 7.65 44.00 84>
45	<AVG 7.82 43.25 >
46	<CYL -1.75 174>
47	CS 12.5
48	=====
49	NIDEK ARK-1s

1	Uncorrected VA values
2	Subjective refractive error measured values An eye diagram is printed out depending on the "52. EYE PRINT" parameter setting.
3	Corrected distance VA values
4	Contrast VA values
5	Glare VA values
6	Near addition powers, near VA values, WD
7	LM values These are values of the patient's own glasses measured by a lensmeter. When the following conditions are satisfied, printing is conducted. • The device is connected to a lensmeter and data is saved in the lensmeter or LM data has been imported from an Eye Care card.
8	LM addition powers (ADD1, ADD2)

ARK-Series SPECIFICATIONS



MODEL	ARK-1s	ARK-1A
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	2mm	
Auto keratometer		
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)	
VA measurement		
Measurement mode	Uncorrected VA, Corrected VA (distance, near)	
Measurement range	Less than 20 / 200, 20 / 200, 20 / 80, 20 / 60, 20 / 50, 20 / 40, 20 / 30, 20 / 25, 20 / 20, 20 / 16	Not available
Correction range	Sphere -20.00 to +20.00 D (VD = 12 mm) (0.25 D increments) Cylinder 0 to ±8.00 D (0.25 D increments) Axis 0 to 180° (1° / 5° increments)	
Vision comparison	Available with VA chart	Scenery Chart
Retroillumination image	Available	←
Accommodation measurement range	0 to 10.00 D (0.01 / 0.12 / 0.25 D increments)	←
PD measurement range	30 to 85 mm (1 mm increments) (Near point PD: 28 to 80 mm at WD = 40 cm)	←
Automatic Corneal size measurement	10.0 to 14.0 mm (0.1 mm increments)	
Automatic Pupil size measurement	1.0 to 10.0 mm (0.1 mm increments)	←
Auto tracking / Auto shot	X-Y-Z directions Auto shot	←
Display	Tilttable 6.5-inch color LCD	←
Printer	Thermal line printer with easy loading and auto cutter	←
Interface	RS-232C (in / out), LAN, USB, Eye Care card system*5	←
Power Supply	AC 100 to 240 V 50 / 60 Hz	←
Power Consumption	100VA	←
Dimensions / Mass	260 (W) x 495 (D) x 457 (H) mm / 20 kg 10.2 (W) x 19.5 (D) x 18.0 (H)" / 44 lbs.	←



Marco technologies integrate with Marco Connect software



Designed and Manufactured by NIDEK - Represented by MARCO

800.874.5274
www.marco.com

