

# Marco **AUTO REFRACTORS AND KERATOMETERS**

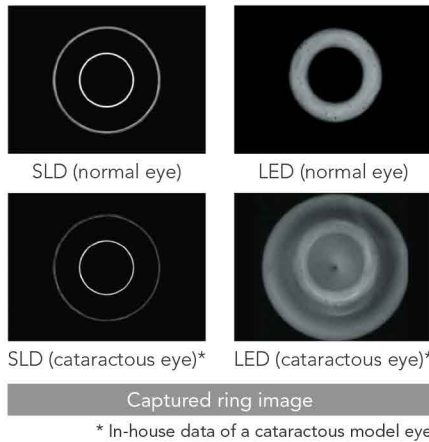
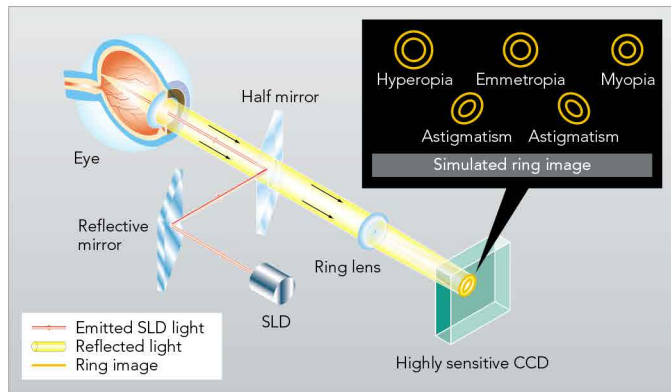


# ARK-Series

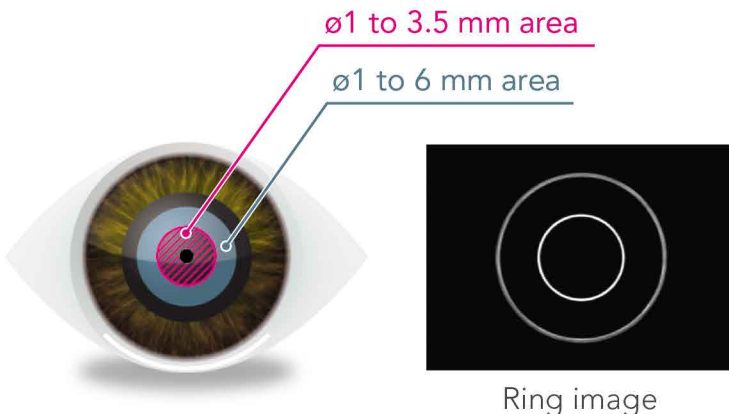
## INTELLIGENT TECHNOLOGIES

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

**Super Luminescent Diode (SLD)** is an edge-emitting semiconductor light source based on super luminescence. It combines 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.



**Double Ring Technology** or multiple pupil zone imaging method gives the practitioner a reliable refraction starting point.



**Automatic Fogging** and high-speed measurements: The ARK-Series automatic fogging minimizes accommodation and maintains



Balloon Target Fogged Target

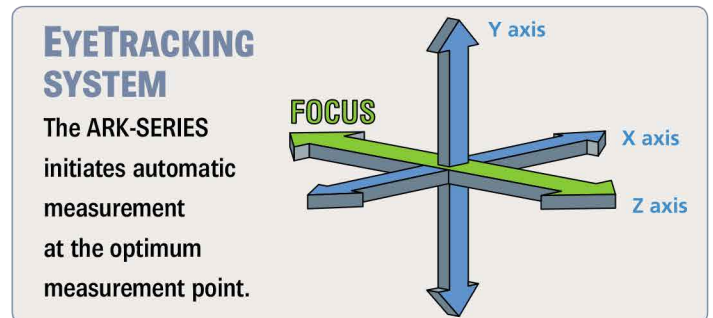
fog throughout all measurement readings. This saves valuable time and is ideal for children and patients who find it difficult to fixate.



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



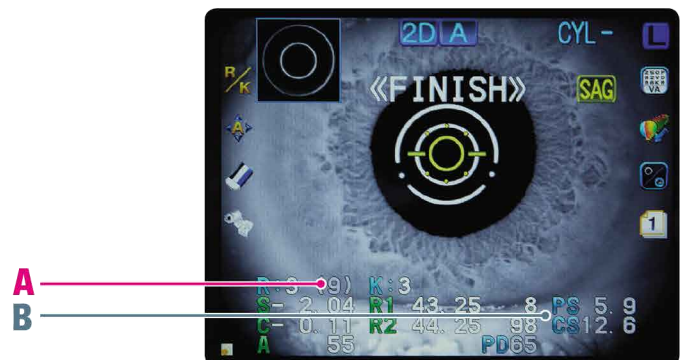
**The EyeTracking System** provides X, Y, Z axes (ARK-1s and ARK-1a only) for superior alignment, tracking and focusing. The ARK-1 Series has a wide measurement range -30D to +25D.



**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 quality 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)

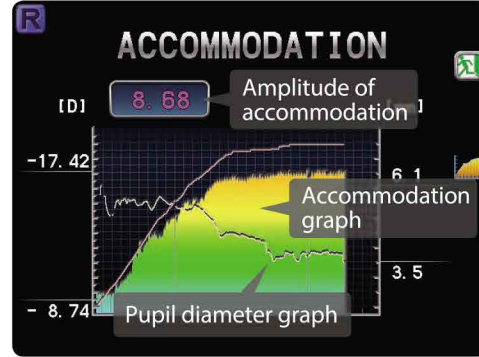
Gives the ability to determine whether low contrast situations diminish a patient's acuity.



Simulated patient's vision of low contrast VA chart

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

Graphs the accommodation on patients especially with presbyopia symptoms, latent hyperopia and children that may have difficulty with reading.



## Retro-illumination (ARK-1s and ARK-1a)

Illustrates media opacity in both the cornea and lens.



Cortical cataract documented in file

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

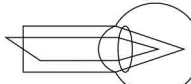
- Subjectively refine the sphere
- Distance vision corrected with AR data
- Uncorrected distance vision
- Near vision corrected with AR data
- Uncorrected near vision
- Comparison with LM data and AR data





# 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
2	Patient ID scanned by the optional barcode scanner or magnetic card reader
3	Vertex distance
4	Near working distance
5	AR-measured values (center)
6	S: Spherical refractive error
7	C: Cylindrical refractive error
8	A: Cylinder axis
9	Confidence index
10	AR median values
11	Spherical equivalent value
12	Printing of eye diagram
13	Thin lens data
14	Contact lens conversion value
15	AR large area measured values
16	PS (Pupil Size) measured value
17	When measurement is performed with the chart-illuminating lamp turned off during manual PS measurement, "(LAMP=OFF)" is printed out.
18	Accommodation measured values
19	MIN: AR-measured minimum value
20	MAX: AR-measured maximum value
21	(PS MIN: Pupil size minimum value, MAX: Pupil size maximum value)
22	An accommodation graph is printed out depending on the "58.ACC GRAPH PRINT" parameter setting.
23	PD (Pupillary Distance)
24	Distance PD, monocular PD, near PD
25	KM median values
26	R1: Flattest meridian
27	R2: Steepest meridian
28	deg: Corneal cylinder axis
29	AVG: Average of R1 and R2
30	CYL: Corneal cylindrical error
31	CS (Corneal Size) measured value
32	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
3	An eye diagram is printed out depending on the "52.EYE PRINT" parameter setting.
4	Corrected distance VA values
5	Contrast VA values
6	Glare VA values
7	Near addition powers, near VA values, WD
8	LM values
9	These are values of the patient's own glasses measured by a lensmeter. When the following conditions are satisfied, printing is conducted.
10	• 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.
11	• Subjective refractive error measurement has been performed.
12	LM addition powers (ADD1, ADD2)



# 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	Palm-ARK	M3	ARK-1	ARK-1a	ARK-1s
Super Luminescent Diode Technology	✔	✔	✔	✔	✔
Automatic	✔	✔	✔	✔	✔
Measurable Range -20D to +25D/Cyl OD to +12D	✔	✔	✔	✔	✔
Scenery Balloon Target Chart	✔	✔	✔	✔	✔
"Marco Connect" EMR Internet Capability	✔	✔	✔	✔	✔
Hand Held Portable Unit	✔				
Minimum Pupil Diameter 2.6mm	✔				
Automatic "Eye Tracking" Technology Y			✔		
Automatic "Eye Tracking" Technology X, Y, Z		✔		✔	✔
Minimum Pupil Diameter 2.0mm		✔	✔	✔	✔
Measureable 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			✔	✔	✔
Double Ring Technology			✔	✔	✔
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 SPECIFICATIONS



Model	ARK-1s	ARK-1a	ARK-1
<b>Auto refractometer</b>			
<b>Measurement range</b>	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)		
<b>Minimum measurable pupil diameter</b>	ø2 mm		
<b>Auto keratometer</b>			
<b>Measurement range</b>	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)		
<b>Sagittal measurement</b>	25° each from the center (superior side, inferior side, temporal side, nasal side)		
<b>VA measurement</b>			
<b>Measurement mode</b>	Uncorrected VA, Corrected VA (distance, near)		
<b>Measurement range</b>	Less than 0.1, 0.1, 0.25, 0.32, 0.4, 0.5, 0.63, 0.8, 1.0, 1.25 or Less than 20 / 200, 20 / 200, 20 / 80, 20 / 60, 20 / 50, 20 / 40, 20 / 30, 20 / 25, 20 / 20, 20 / 16	Not available	Not available
<b>Correction range</b>	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)		
<b>Vision comparison</b>	Available with VA chart	Scenery Chart	Scenery Chart
<b>Retroillumination image</b>	Available	←	Not available
<b>Accommodation measurement range</b>	0 to 10.00 D (0.01 / 0.12 / 0.25 D increments)	←	Not available
<b>PD measurement range</b>	30 to 85 mm (1 mm increments)	←	←
	(Near point PD: 28 to 80 mm at WD = 40 cm)	←	←
<b>Automatic Corneal size measurement</b>	10.0 to 14.0 mm (0.1 mm increments)	←	←
<b>Automatic Pupil size measurement</b>	1.0 to 10.0 mm (0.1 mm increments)	←	←
<b>Auto tracking / Auto shot</b>	X-Y-Z directions Auto shot	←	Y direction Auto shot
<b>Display</b>	Tiltable 6.5-inch color LCD	←	←
<b>Printer</b>	Thermal line printer with easy loading and auto cutter	←	←
<b>Interface</b>	RS-232C (in / out), LAN, USB, Eye Care card system*5	←	←
<b>Power supply</b>	AC 100 to 240 V 50 / 60 Hz	←	←
<b>Power consumption</b>	100 VA	←	←
<b>Dimensions / Mass</b>	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

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www.marco.com

