NIDEK

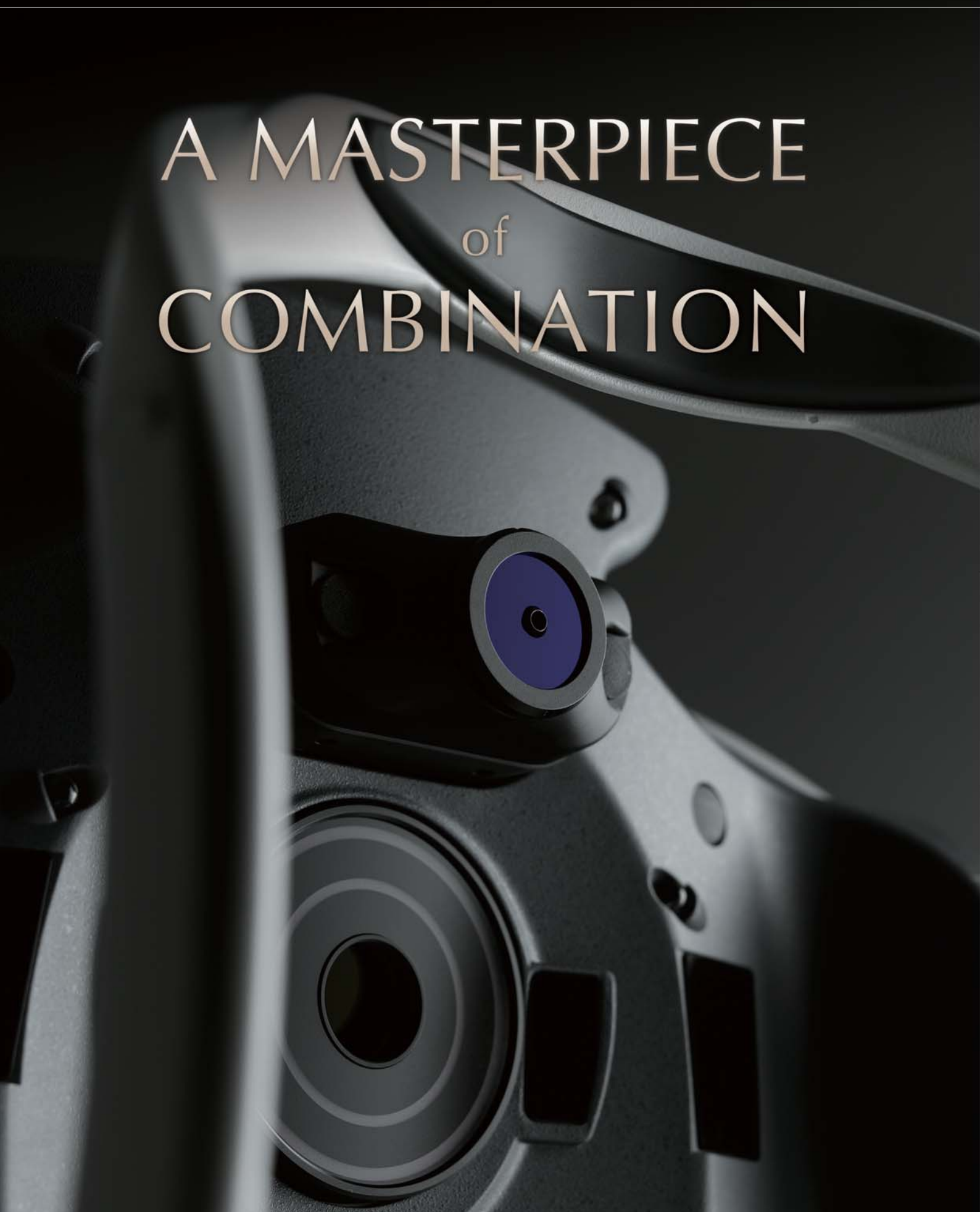
Auto Ref / Kerato / Tono / Pachymeter

TONOREF™ III

THE ART OF EYE CARE

TONOREF III

AUTO REF / KERATO / TONO / PACHYMETER



The space saving TONOREF™ III
is a comfortable and
efficient upgrade to your practice

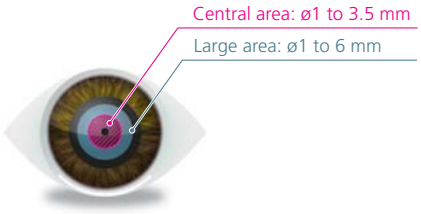
Auto Refractometer
Auto Keratometer
Non Contact Tonometer
and
Non Contact Pachymeter

High Measurement Accuracy

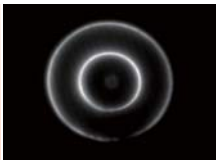
Refraction

Large Pupil Zone Imaging Method

The use of a wide area measurement within the pupil increases the accuracy of measurement that is more indicative of the subjective refraction.
The large pupil zone imaging method measures the central refraction and a large area refraction.
The difference in the measurement allows assessment of the effect of pupil size* on vision under mesopic conditions.
*The pupil diameter is measured simultaneously.
Measurements can be performed on small pupils as small as 2 mm.



Low Confidence Alert
The measurement ring image can be displayed to alert the operator if low confidence measurement occurs.



Ring image

Super Luminescent Diode (SLD) Light and Highly Sensitive CCD Camera

The system combining the SLD Light and highly sensitive CCD camera significantly improves measurement capability even in dense cataractous eyes.

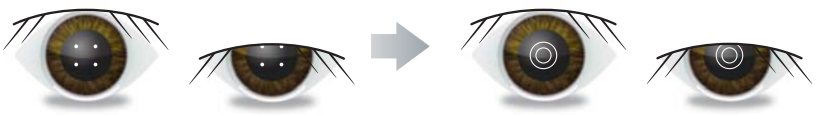
Optimal Fogging to Minimize Accommodation

Fogging is performed after correcting the patient's astigmatism with built-in cylinder lenses.
This minimizes the effect of accommodation even of patients with high astigmatism.

Keratometry

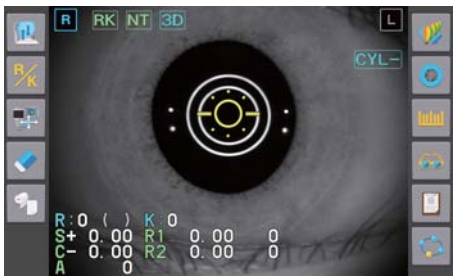
Double Mire Ring Method

Keratometry measurements performed with the mire ring method reduces interference from the eyelids.
The TONOREF™ III performs measurements at diameters of 3.3 mm and 2.4 mm.
Comparison of the two values allows a better understanding of the cornea shape.



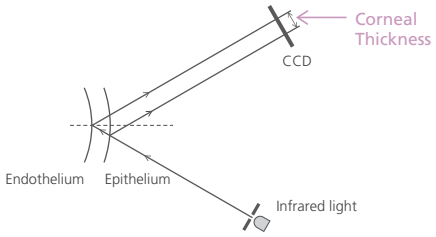
Measurement with four points
(TONOREF™ II)

Measurement with double mire ring
(TONOREF™ III)

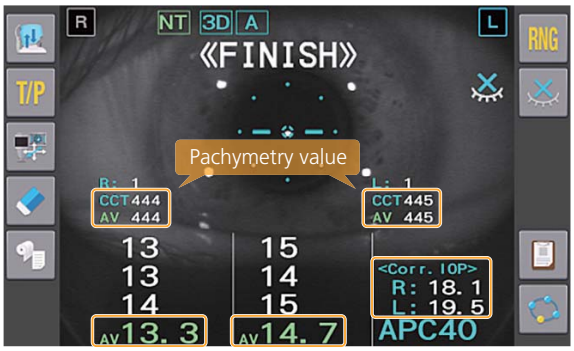


Pachymetry

Non-contact optical pachymetry is used to measure corneal thickness.



The principle of specular reflection for pachymetry allows a more compact design of TONOREF™ III.

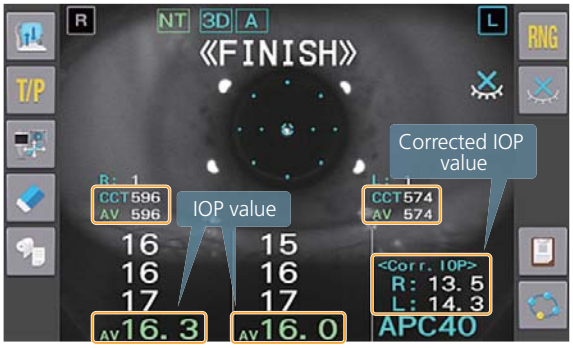


The pachymetry data can be used to display a corrected IOP value.

Tonometry

Automated Calculation of Corrected IOP

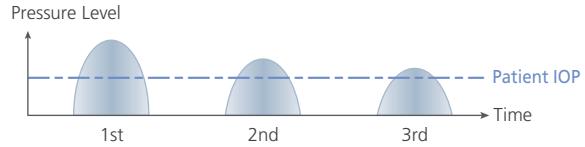
The TONOREF™ III provides the automated calculation function of the corrected IOP based on the central corneal thickness.
Generally, the IOP is overestimated for thick corneas and underestimated for thin corneas. The corrected IOP value allows a more accurate assessment.



Patient-friendly Air Puff

Automatic Puff Control (APC)
In subsequent measurements, the APC function performs the measurement with the minimum air pressure based on the previous measurement data.

With APC



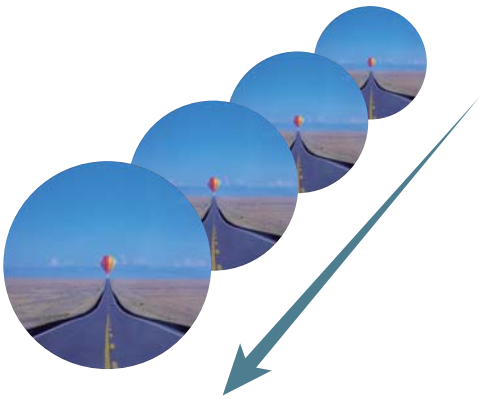
Softer and Quieter Air Puff
The new mechanical design of the TONOREF™ III reduces noise and air intensity to achieve a more gentle air puff over that of the TONOREF™ II.

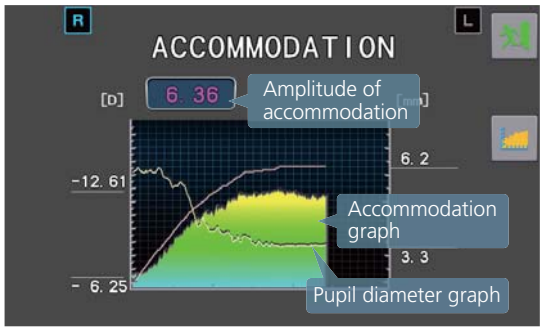
Gentle Nozzle Design
A gentle nozzle design reduces patient's perception of physical pressure.

Clinically Important Functions

Accommodation Measurement

The accommodation measurement helps to assess such as pseudomyopia, eyestrain, and accommodative palsy. Objective measurement of accommodation is performed with patient's focusing on a target that moves from distance to near. The intelligence algorithm detects the patient's response and reduces the measurement time in patients with a slow or weak accommodative response.

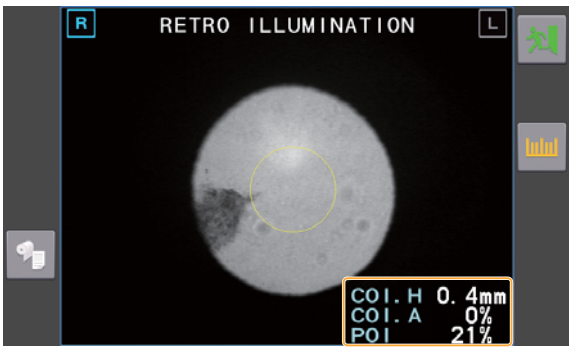




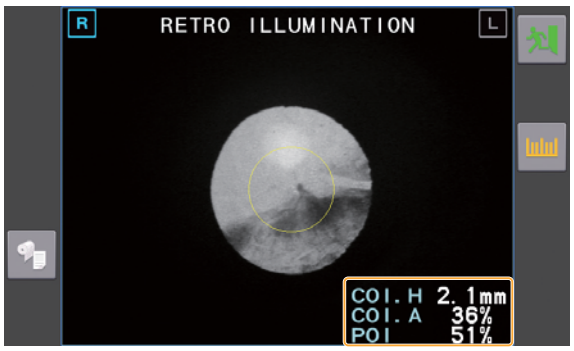
Opacity Assessment

Retroillumination Image and NIDEK Cataract Indices

The retroillumination image allows evaluation of media opacity. NIDEK cataract indices indicate the severity of the opacity and helps to assess the progression of pathology.



Eye with light opacity



Eye with dense opacity

NIDEK Cataract Indices

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

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

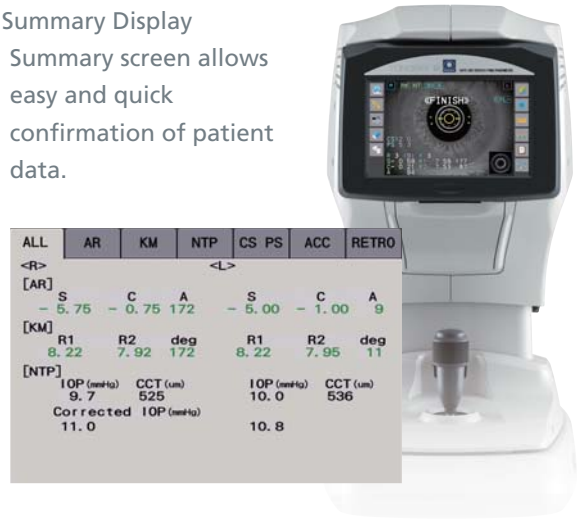
- Peripheral image is darkly captured due to alignment position.
- Opacities are not in focus.
- Bright spot reflecting observation light occurs on the cornea apex.
- Position of the 3 mm diameter circle is shifted due to incorrect pupil detection caused by opacity location.

User-friendly Design

Easy to Use Screen

- Tiltable 7-inch color LCD touchscreen

- Summary Display
  Summary screen allows easy and quick confirmation of patient data.

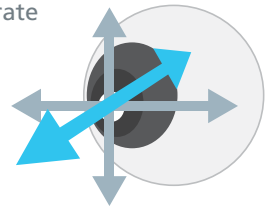


Easy Access to Patients Eyelids

The radical cut design allows direct access to patient eyelids.

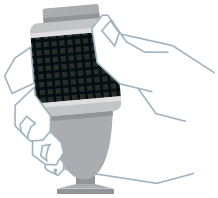
3-D Auto Tracking and Auto Shot

The 3-D auto tracking and auto shot provide faster, simpler, and more accurate measurements.
Once alignment is completed, the measurement starts automatically.



Joystick for Flexible Alignment

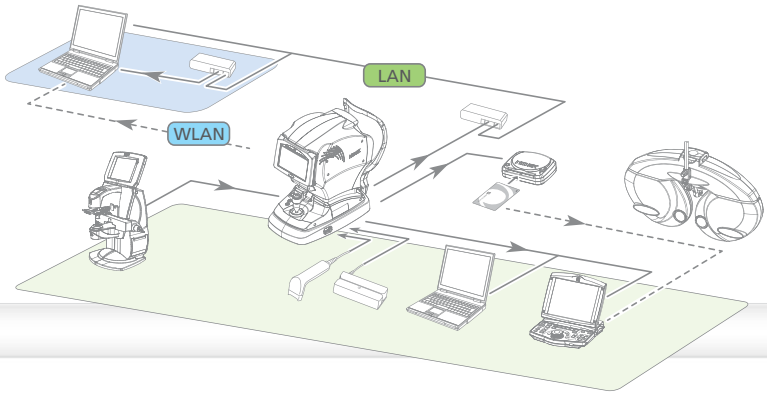
The joystick helps the operator make fine adjustments during alignment to improve the precision, even for eyes with poor fixation which cannot be tracked with automated tracking systems.



Wireless LAN (WLAN)

The TONOREF™ III connects with PC and peripheral devices using wireless LAN (WLAN)*, LAN cable, RS-232C cable, EyeCare Card, barcode scanner or magnetic card reader.

*Available for products shipped for USA, Canada, and other countries that implement the R&TTE Directive.



Automatic Anti Dew Heater

Automatic anti dew heater for measuring windows prevents condensation to provide accurate measurements in cooler rooms.

TONOREF™ III 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
Measurement area	ø1 to 6 mm
Chart	Scenery chart
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)
Measurement area	ø3.3 mm (R=7.7 mm), ø2.4 mm (R=7.8 mm)
Non contact tonometer	
Measurement range	1 to 60 mmHg (1 mmHg increments)
Measurement range setting	APC40, APC60 (APC=Automatic Puff Control), 40, 60
Working distance	11 mm
Eye fixation	Inner fixation light
Non contact pachymeter	
Measurement range	300 to 800 µm (1 µm increments)
IOP correction by corneal thickness	Automatic calculation
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)
Corneal size measurement range	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	X-Y-Z directions
Auto shot	Available
Display	Tiltable 7.0-inch color LCD with touch panel
Printer	Thermal line printer with easy loading and auto cutter
Interface	RS-232C: 2 port, LAN: 1 port, USB: 1 port Wireless LAN (WLAN)*: 1ch
Power supply	AC 100 to 240 V, 50 / 60 Hz
Power consumption	100 VA
Dimensions / Mass	260 (W) × 495 (D) × 505 (H) mm / 22 kg at ARK standard mode 260 (W) × 495 (D) × 460 (H) mm / 22 kg at NT standard mode 10.2 (W) x 19.5 (D) x 19.9 (H) " / 48 lbs. at ARK standard mode 10.2 (W) x 19.5 (D) x 18.1 (H) " / 48 lbs. at NT standard mode

*Limited to the USA, Canada, and other countries that implement the R&TTE Directive.

Product / Model name: AUTO REF / KERATO / TONO / PACHYMETER TONOREF III
Specifications may vary depending on circumstances in each country.
Specifications and design are subject to change without notice.

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