



Tabletop Refraction System  
**TS-310**

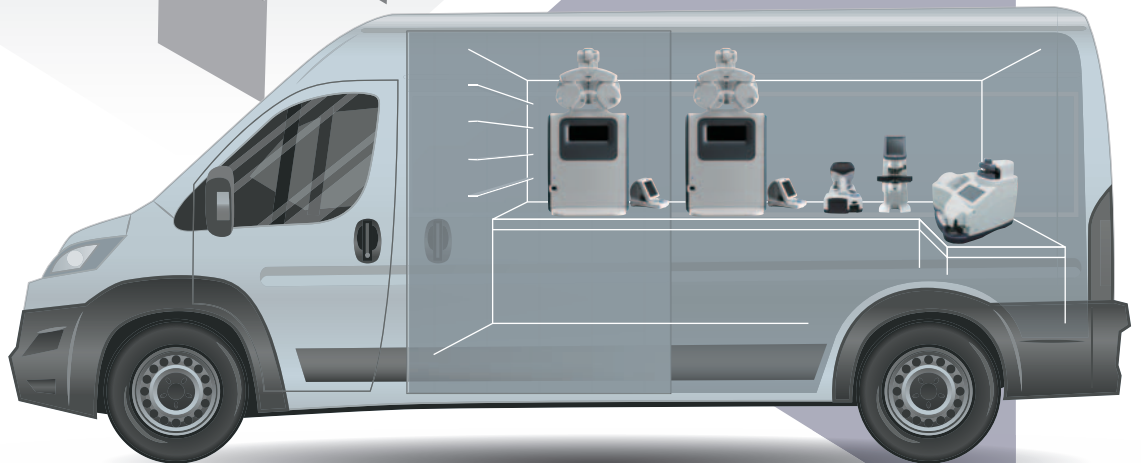
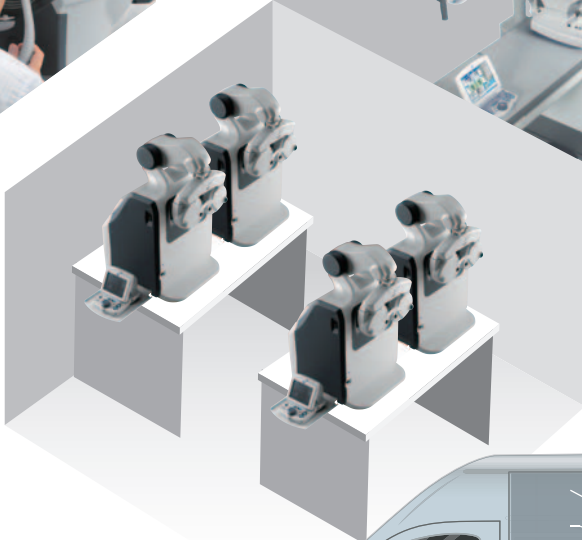


THE ART OF EYE CARE

# Design your space

The TS-310 is a tabletop subjective refraction system that integrates chart and refractor into a single unit. NIDEK's recognized quality examination is embodied in a new, groundbreaking design that redefines the conventional refraction systems and significantly minimizes the examination footprint.

Compact design enables easy installation and office assimilation, while the stylish shape complements the progressive image of your facility. The TS-310 fulfills the need for simple and reliable refraction, in an attractive design, wherever space limitations exist.



# Triple-performance combination

## Operation-oriented control box

### Intuitive color LCD touch screen

The 5.7-inch color LCD touch screen displays all data with high visibility. Simple, understandable, and comfortable user interfaces ensure an effective operation.



### Dial button with S / C / A mode key

Ergonomically focused, the main control dial, which has S / C / A mode key in its center, allows for quick and smooth refractive value changes.



### Built-in high-speed line printer

The control box includes a built-in, high-speed printer which automatically outputs all measurement data in a format that provides easy interpretation and explanation to patients.



## Sophisticated refractor

### Ergonomic design

Beautiful ergonomic design enhances a stress-free examination environment for both operator and patient, while maintaining superior accuracy.



### Smooth lens change

Speedy, smooth and quiet lens changing enables operator to make minute changes of prescription at the touch of a button.



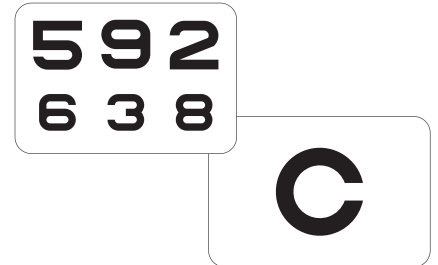
### Easy maintenance

Antifogging protective glass, detachable forehead rest and face shields, support easy maintenance.

## Reliable chart unit

### Same charts for far and near vision measurement

The TS-310 uniquely uses the same high resolution charts for both far and near testing. Switching between far and near is smoothly achieved with a single button push.



### High precision, large, color LCD

The brilliant clarity of the LCD, allows visual acuity at 5 m and near visual acuity at 40 cm to be measured with the same accuracy as actual distances.

### Contrast test

To support patients who have undergone cataract or refractive surgery, the TS-310 has the ability to measure contrast sensitivity at three different levels below the normal threshold.























### Black and white inversion function

The VA chart can be selected from black on white to white on black.



### TS-310 Chart Type\*

|                            | Type T  |   |   |
|----------------------------|---|---|---|
|                            | Distance / near   | Near  |   |
| Letter                     | 0.04 to 1.5   | 0.1 to 1.0  |   |
| Number                     | 0.04 to 1.5   | 0.1 to 1.0  |   |
| Tumbling E                 | 0.1 to 1.5  | 0.1 to 1.0  |   |
| Landolt C                  | —   | —   |   |
| Children                   | 0.1 to 1.0  | —   |   |
| ETDRS style letters        | 0.32 to 2.0   | —   |   |
| Letters and Numbers        | —   | 0.63  |   |
| Astigmatism clock dial     |  | —   |   |
| Dots                       |  | —   |   |
| Red-green                  |  | —   |   |
| Cross grid                 |  | —   |   |
| Binocular balance          |  | —   |   |
| Duochrome balance          |  | —   |   |
| Phoria                     |  |  | — |
|                            |  |  |   |
| Phoria with fixation point |  |  | — |
| Vertical line              | —   |  |   |
| Horizontal line            | —   |  |   |
| Vertical coincidence       |  |  | — |
| Horizontal coincidence     | —   | —   |   |
| Schober                    |  | —   |   |
| Stereo                     |  | —   |   |
| Worth four dot             |  | —   |   |
| Fixation point             |  | —   |   |

\* In addition to the Type T chart, other chart types are available.

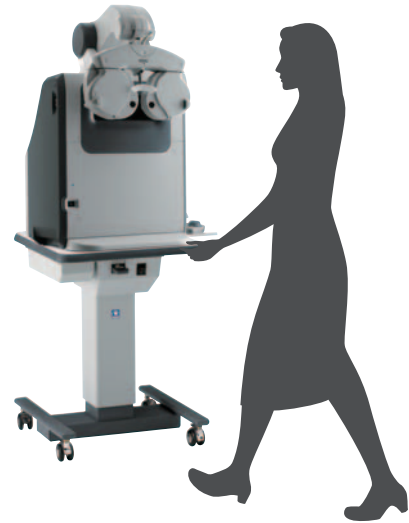
# User-friendly features

## Symmetry design

Clean symmetry design, without a refractor pole, allows examinations from both right and left side of patients. In this way, multiple TS-310 units can be positioned with the greatest flexibility.

## Flexible measurement style

Regardless of personal measurement style, or sitting / standing ergonomic preferences, the TS-310 ensures comfortable examinations.

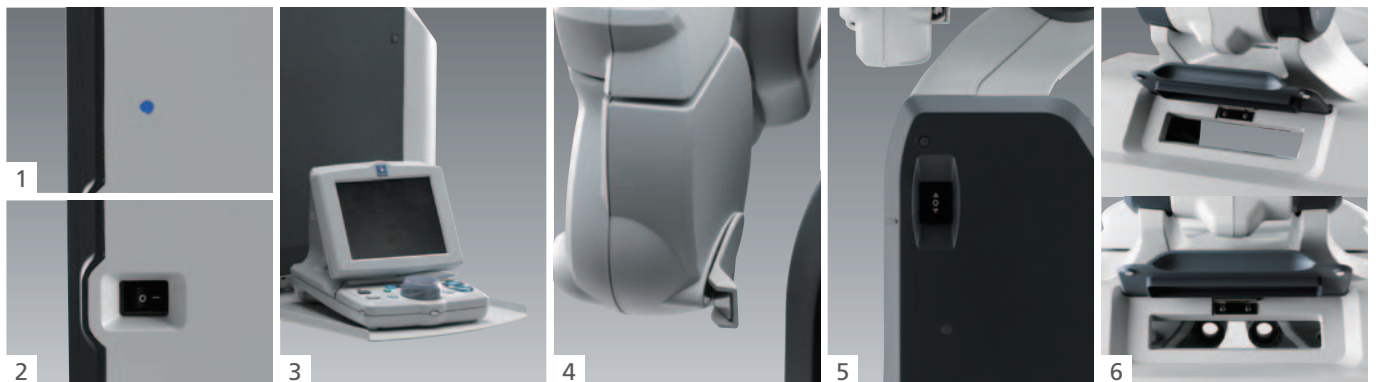


## Easy installation

The TS-310 does not require complex angle and distance adjustments during installation, which can be achieved by any staff member without expert knowledge. It can be easily transported and installed in any facility including optometric offices, mobile optometric vehicles, and care facilities for temporary use.

## Operational efficiency

The TS-310 embodies numerous ingenuities, which support both accuracy and functional flexibility, to create a new standard in examination efficiency.



1. Pilot lamp for power on / off / auto off mode
2. Power switch
3. Control box tray (optional)

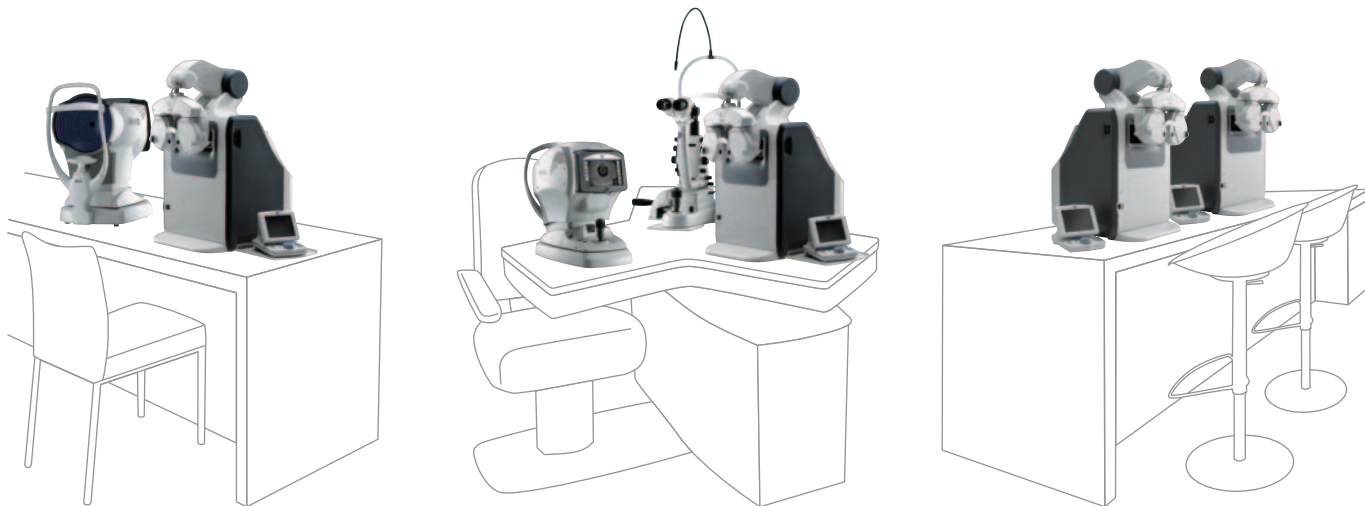
4. VD check adapter  
(standard / additional adapters are optional.)
5. Refractor head vertical motion switch
6. Pupil position check window / cover

# Scalable according to your needs

Due to the compact and simple body shape, the TS-310 fits any table or location.

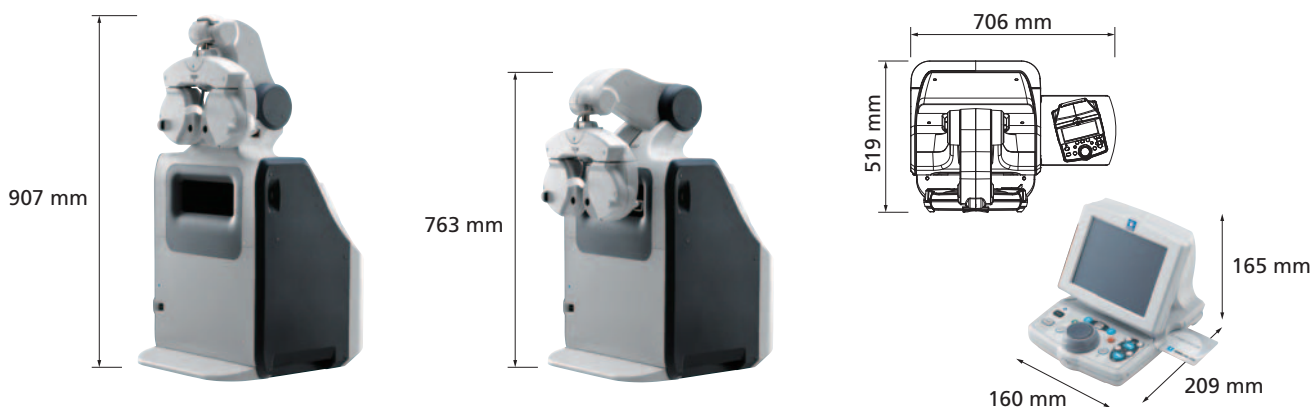
NIDEK refraction products allow for quick and easy wireless data transfer\* using the Eye Care card, Bluetooth, WLAN or infrared communication. This is helpful for making a simple refraction system without complicated wired connection.

\*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.



## Compact footprint

Super space-saving design of the TS-310 (from 0.4 to 0.7 m wide, 0.5 m deep), offers flexible room arrangement without compromising the precision of conventional refractions. The compact footprint is unchanged, whether the refractor head is in the raised or lowered position.



# TS-310 Specifications

|                                  |   |
|----------------------------------|---|
| Chart                            | T, UK, M, P, PhM  |
| Chart type                       | Distance: 5 m, Near: 40 cm  |
| Refraction distance              | Horizontal line, Vertical line, Single letter   |
| Mask                             | Red / Green   |
| Filter                           | Red-green, Prism  |
| Binocular vision test            |   |
| Refractor                        |   |
| Measurable range                 |   |
| Sphere                           | -19.00 to +16.75 D (0.25 / 0.5 to 3 D increments)   |
| Cylinder                         | 0.00 to $\pm 6.00$ D (0.25 / 1 D increments)  |
| Axis                             | 0 to 180° (1°/5° increments)  |
| PD                               | 48 to 80 mm   |
| Prism                            | 54 to 80 mm (100% convergence possible PD)<br>0 to 20 $\Delta$ (0.1 / 0.5 / 2 $\Delta$ increments)  |
| Auxiliary lens                   |   |
| Cross cylinder lens              | $\pm 0.25$ D  |
| Occluder                         | Available   |
| Pinhole plate                    | $\phi 2$ mm   |
| Red / Green filter               | Right eye: red, Left eye: green   |
| PD check lens                    | Available   |
| Fixed cross cylinder lens        | $\pm 0.50$ D  |
| Spherical lenses for retinoscope | +1.5 / +2.0 D   |
| Red maddox rod                   | Right eye: horizontal, Left eye: vertical   |
| Dissociation prism               | Right eye: 6 $\Delta$ BU / Left eye: 10 $\Delta$ BI, Right eye: 3 $\Delta$ BD / Left eye: 3 $\Delta$ BU   |
| Visual field                     | 40° (VD = 12 mm), 39° (VD = 13.75 mm)   |
| Forehead rest adjustment         | 14 $\pm$ 2 mm   |
| Vertex distance marking          | 12, 13.75, 16, 18, 20 mm  |
| Level adjustment                 | $\pm 2.5^\circ$   |
| Refractor arm                    | Electrically-driven   |
| Up-and-down of refractor arm     | 190 mm  |
| Control box                      |   |
| Display                          | 5.7-inch color  |
| Printer                          | High speed line printer   |
| Power supply                     | AC 100 to 240 V, 50 / 60 Hz   |
| Power consumption                | 130 VA  |
| Dimensions*1                     | The refractor head vertical motion unit is at the bottom.<br>446 (W) x 519 (D) x 763 (H) mm<br>17.6 (W) x 20.4 (D) x 30.0 (H)"<br>The refractor head vertical motion unit is at the top.<br>446 (W) x 487 (D) x 907 (H) mm<br>17.6 (W) x 19.2 (D) x 35.7 (H)" |
| Mass*2                           | 32 kg<br>70.5 lbs.  |
| Standard accessories             | Forehead rest, Face shields, VD check adapter, Stylus pen, Printer paper, Dust cover, Power cord, Cover plate, Cap, Screw, Hexagonal wrench, Phillips screwdriver   |
| Optional accessories             | Eye Care card, Communication cable for an auto refractometer, Communication cable for a computer, Control box tray  |

\*1 Control box excluded.

\*2 Refractor head and control box included.

Product / Model name: Tabletop Refraction System TS-310

All LCD images are simulated.

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

Specifications may vary depending on circumstances in each country.

Specifications and design are subject to change without notice.



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