

# Urinalysis

## On-the-spot urine strip analysis and microscopy

- > Portable, hand-held precision
- > Immediate results for health care parameters
- > Innovative AI-based urinalysis



Video

**Human**

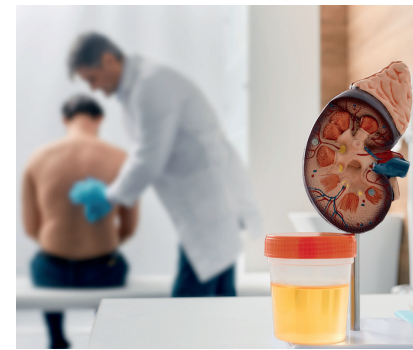
Diagnostics Worldwide

# Urinalysis

## Portable, on-the-spot testing

### Urine diagnostic for a wide range of medical conditions

Urinalysis provides essential insights into various bodily functions and is routinely performed as a basic screening test for nearly all patients. It begins with the use of urine strips followed by urine microscopy to investigate abnormal findings in greater detail. These findings may indicate conditions such as urinary tract infections, diabetes mellitus, renal insufficiency, kidney and bladder stones, kidney and bladder cancer, or liver diseases.



### Urine test strip analysis

Urine dipstick tests detect the presence of waste chemicals in urine. They offer a quick identification of analytes like glucose, proteins, ketones, pH, bilirubin, nitrites, leukocytes or blood. The respective results provide information on metabolic and systemic conditions.

### Urine microscopy: manual vs. AI-based particle analysis

This method identifies and counts the formed particles, such as cells, crystals, casts, bacteria, and other particle.

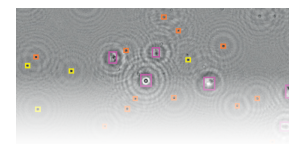
Urine particle analysis ideally should be performed on native urine, immediately after sampling, to avoid the loss of cells or changes in particles over time or due to preparation steps.

The results of manual microscopy, depend on the sample preparation steps (centrifugation, sediment sampling) and user operator skills. When using HumaVision with artificial intelligence (AI) and Digital Holographic Microscopy (DHM), urine particle analysis becomes objective and fast. By utilizing native urine, sample preparation steps become obsolete.

*«Automation not only reduces the risk of human error but also saves time and ensures digital documentation and storage of results, improving accuracy and traceability.»*



Manual



AI-based

	Manual	AI-based
<b>Time to result</b>	20-30 min.	2-7 min.
<b>Particle differentiation and counting</b>	Well-educated operator eye	Artificial intelligence (AI) and Digital Holographic Microscopy (DHM)
<b>Differentiator</b>	Particle size (2D), particle shape (2D) Particle gray scale	Particle size (3D), particle shape (3D), Particle gray scale Particle phase information (based on refractive index, geometry, topography)
<b>Results standardization</b>	Inter-observer variability	1 million particles test data base for each parameter
<b>Analyzed sample volume</b>	0.041 mm <sup>3</sup>	0.525 mm <sup>3</sup> , 13 times bigger volume
<b>Sample preparation</b>	Centrifugation and pipetting	None
<b>Reporting</b>	Manual	Digital
<b>Results</b>	Semi-quantitative (no counting chamber)	Quantitative, count/μl

# HumaCombilyzer & HumaCombina

## Portable urine test strip reader

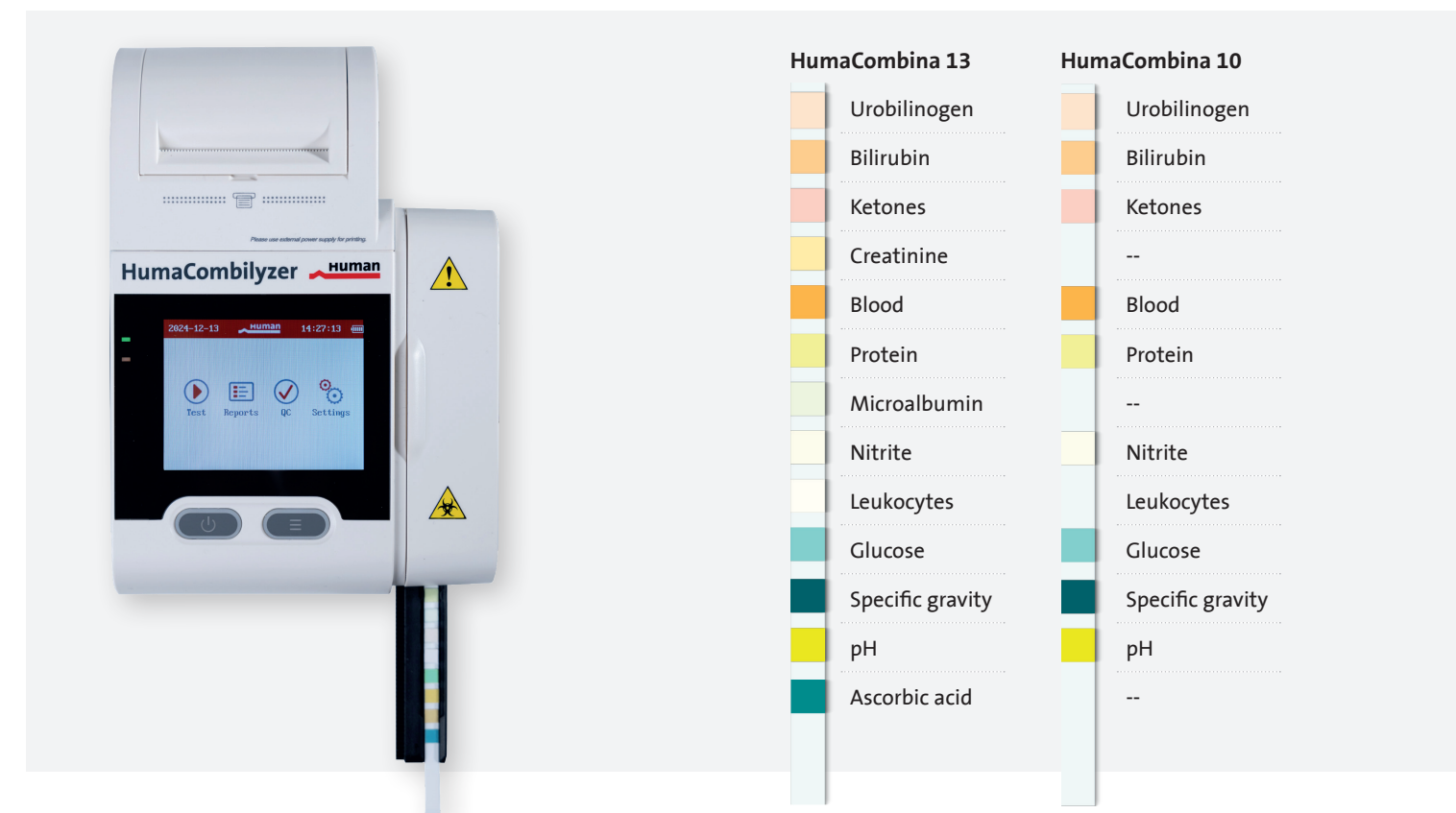
HumaCombilyzer is a portable, semi-automated urine test strip analyzer, ideal for in-office and more rural healthcare settings.

### Ideal for different healthcare settings

- › Easy-to-use instrument for reading of HumaCombina urine test strips
- › Ergonomic and lightweight instrument design supports handheld use
- › Optional battery operation increases mobility
- › Provides fast patient results within 60 seconds
- › Flexible immediate or subsequent direct result printout, no need for manual transcription

### Reliable and standardized patient results

- › HumaCombina urine test strips enable fast and effortless assessment of urine status, supporting the detection of pathological changes
- › Automated result reading eliminates the subjectivity of visually read results
- › Consistent and automatic timing, urine strip reading, and result interpretation
- › Alternative strip options tailored to different diagnostic needs



### Easy and convenient handling

- › Large color touchscreen offering an intuitive operational interface
- › QC module supporting consistent result quality
- › HumaCombina urine strips are designed for visual and automated testing of up to 14 parameters
- › Optional handheld barcode scanner eliminating the risk of manual sample ID data entry errors
- › Albumin-to-creatinine ratio (ACR) for early detection of kidney disease
- › Automated abnormal result flagging supporting fast result interpretation
- › Uni-directional LIS capability meeting the growing demand for compliance management and data capture
- › Minimal cleaning required, reducing maintenance time significantly



# HumaVision

## Innovative automated urine particle analysis with AI

Revolutionized lab workflow for native urine particle analysis, minimizing errors, streamlining processes, and maximizing operational efficiency.

### The smallest, most comfortable urine microscope on the market

- > Ergonomic, handheld design with 240 grams
- > 2 - 5 hours of battery operation for increased mobility
- > Immediate diagnosis for better patient care – no sample transportation and preparation needed
- > Accessible for various healthcare settings
- > Ready-to-use sample slides prepared for immediate quantitative application (as in counting chambers)

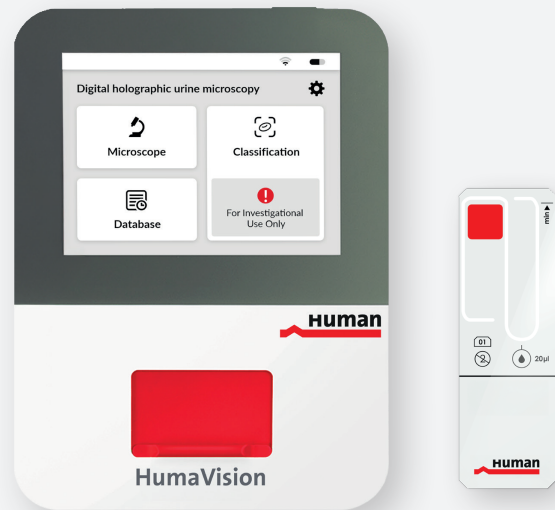
### Accuracy you can rely on

- > AI-based differentiation and quantification for more reliable results, eliminating subjective misinterpretation
- > Native urine analysis ensures accuracy by preventing the potential loss of erythrocytes, leukocytes, or epithelial cells during centrifugation
- > A field-of-view 13 times larger than manual microscopy

### Digital holographic microscopy revolutionizes urine diagnostics

In Digital Holographic Microscopy (DHM), light passing through a sample is partially diffracted, while some remains unaffected. The interaction between diffracted and non-diffracted light forms a hologram, which is digitally reconstructed to reveal details about elements such as blood cells, crystals, or casts within the sample.

Particle classification is performed by advanced artificial intelligence algorithms. DHM leverages 3D cell size, 3D cell shape and a 13 times bigger field-of-view than manual microscopy. As a result, the analysis is significantly more accurate.

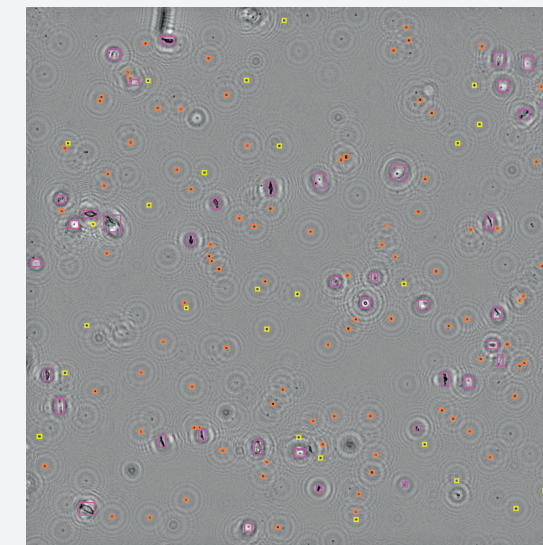


### Designed to make work easier

- > Quantitative determination of urine parameters in 3 to 7 min
- > Only 20 µl sample volume of native urine required
- > Eliminates the need for complex sample preparation, ensuring accurate results with fewer steps, saving time, and enhancing precision
- > Intuitive user interface with a step-by-step guide

### Urine particles quantified by artificial intelligence (AI)

Digital Holographic Microscopy (DHM) technology enables the quantification of urine-formed elements, analyzing hundreds of cells and particles within a 3D volume with high accuracy.



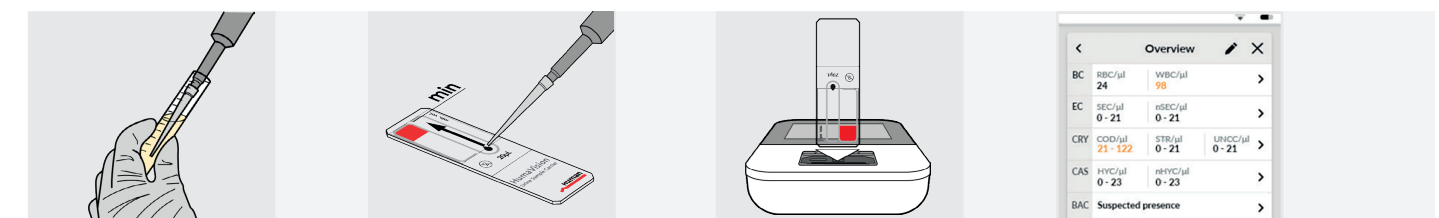
- RBC** Red blood cells
- WBC** White blood cells
- SEC** Squamous epithelial cells
- NSEC** Non-squamous epithelial cells
- COD** Calcium oxalate dihydrate crystals
- STR** Struvite crystals
- UNCC** Unclassified crystals
- HYA** Hyaline casts
- NHYA** Non-hyaline casts
- BAC** Bacteria flagging

### Excellent reporting and data management

- > User-friendly software for result validation and reporting
- > Easy data transfer via WiFi
- > Consistent digital result documentation, viewable on the device, transferable to LIS, or exportable as a PDF to any PC within the hotspot provided by HumaVision.
- > Storage capacity for 300 patient reports with images



### Intuitive 2-step workflow – up to 80% faster than manual microscopy



Pipette 20 µl of native urine into the sample carrier; centrifugation is not required.

Insert the sample carrier into the HumaVision to get quantitative urine results and digital reports.

A secondary examination using a microscope is always possible when using the HumaVision glass slide as the sample carrier.

# Specifications

## HumaVision and HumaCombilyzer



### HumaVision REF 17660

Analyzer type	Automated urine particle analysis
Operation mode	Image mode (2048 x 2048 px), AI-mode (not available in Europe)
Throughput	Up to 20 samples per hour
Multi-language	EN, ES, FR, IT, DE, RU
Display	3.5 inch touchscreen
Battery Runtime	2-5 hours
Connectivity	WIFI, LIS
Storage	300 sample results with images
Weight	240 g
Operation Temp.	18-25°C
Dimensions (WxDxH)	128 x 94 x 33 mm

### HumaVision consumables

Urine sample carrier 100 glass sliders (20 µl) native urine	REF 17661
Sensor cleaner sticks for cleaning the HumaVision	REF 17662

### HumaCombilyzer REF 17630

Analyzer type	Automated urine strip analyzer
Operation mode	Reflectometric reading
Throughput	Up to 50 test strips per hour
Language	EN
Display	320 x 240 pixel touchscreen
Optional operation	AA batteries
Connectivity	LIS, USB micro
Storage	10,000 patient results
Optional	Handheld barcode reader
Weight	600 g
Operation Temp.	10-30°C
Dimensions (WxDxH)	200 x 137 x 52 mm

### Urine test strips

HumaCombina 13 100 test strips	REF 22130
HumaCombina 10 100 test strips	REF 22100

