

# HumaStar 600

Random-Access Clinical Chemistry System

**So easy to handle**

- > High throughput
- > Reliable performance
- > Workflow-optimized handling

CLINICAL CHEMISTRY

CoreLab DX



Movie



Clinical Chemistry Line

**Human**

Diagnostics Worldwide

# HumaStar 600

## High-Throughput Random-Access Clinical Chemistry System

### Efficient operation

- Less than 4l water consumption
- Ready to use HUMAN System Reagents
- Up to 600 results/hour w/o ISE
- Up to three reagents/method
- 160 re-usable reaction cuvettes
- Two independent reaction carousels
- 24 hour on board reagent storage
- Random-access for reagents and samples
- Minimal reagent consumption
- Automated pre/post-dilution

### Workflow-optimized handling

- Easy to use software
- 48 cooled reagents on board
- Barcode recognition of reagents, samples and racks
- Convenient loading of reagents, samples and consumables
- 95 samples (5 racks x 19)
- Stat rack for immediate measurement
- Liquid level sensor



*HumaStar 600 is compact and versatile*

### Reliable performance

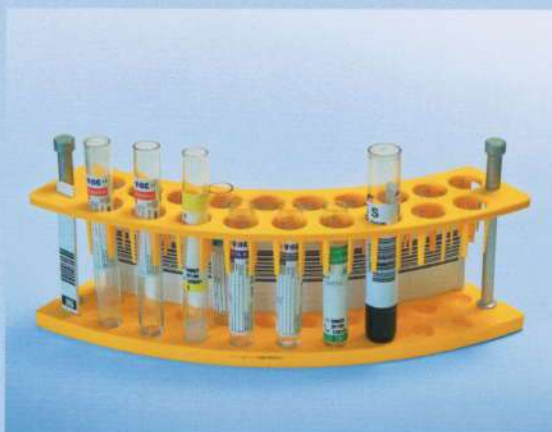
- Clot detection
- Validated HUMAN assay applications
- Internal and external probe washing
- Two independent pipettors



*Convenient loading of reagents*



*Convenient loading of samples*



*Sample racks for a variety of primary tubes and samples cups*

# VERSATILITY

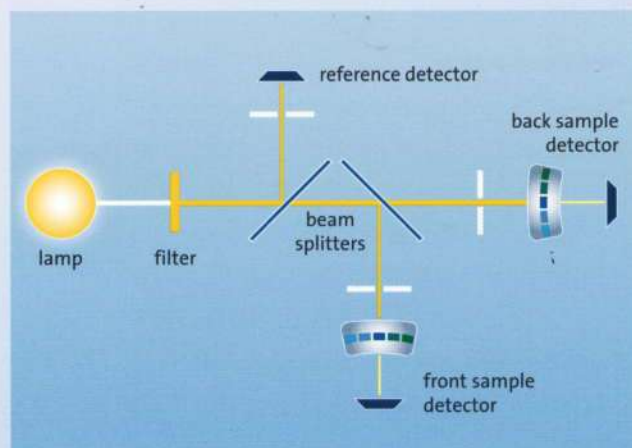
## Made for Cost-Saving Workflow Integration



*Two independent pipettor arms for fast and constant workflow*

### Clinical chemistry & immunoturbidimetry – Quality Made in Germany

- More than 40 HUMAN high quality system reagents:
  - Ready-to-Use
  - Barcoded
  - Long on board stability (up to 60 days)
  - Long calibration stability (up to 60 days)
- Validated and optimized applications:
  - Minimal reagent consumption
  - High Sensitivity and wide linearity-range
- Up to 5 open channels for user defined methods



*Single-lamp, triple-channel photometer for minimum maintenance and reliable performance*

### ISE (optional)

- Serum/plasma or urine samples
- Up to 100 samples / hour
- 6 to 12 months on board stability of electrodes
- ISE unit retrofittable

### State-of-the-art optical system

- High precision – small filter bandwidth
- High resolution
- Large measuring range
- Suitable for most tests between 340 and 800 nm (12 filters on-board)



*Cuvette-washing units in each reaction tray*



*Re-usable cuvettes*



*ISE-Module*

# LOGICAL AND FLEXIBLE: A USER INTERFACE AND FEATURES THAT MAKE OPERATION & QC SIMPLE

## Flexible cycle time

- › Individual optimization of each assay run
- › Faster run

## Calibration validity check

- › Highest quality of results

## Cuvette quality monitor

- › Ensuring reliability of results
- › Optional manually initiated cuvette washing

## Easy graphics

- › Colour-coding
- › Immediate access to problem solution
- › Minimizing operator error

## Adaptive settings

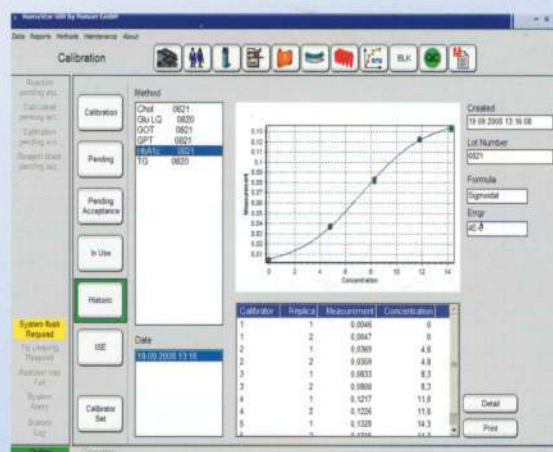
- › Flexible operations through user-defined panels
- › Simplified distribution of workflow
- › Enhanced reliability of results due to separation of critical assay combinations

## Reagent and waste minimization

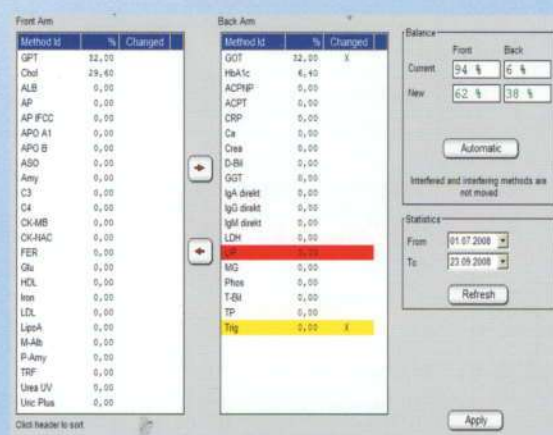
- › Reagent consumption monitor alerts before run

## Variable result output

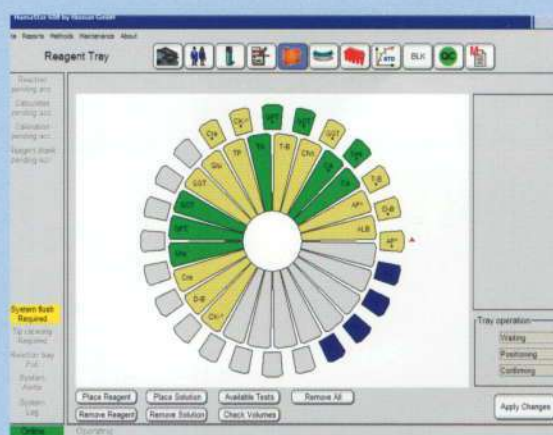
- › LIS-capable
- › Multiple printing options



Calibration details



Optimization of throughput



Reagent tray monitor

# SOFTWARE – AS EASY TO USE AS IT IS VERSATILE

## Intuitive user software

- Intelligent inventory management
- Multi reagent placement for any given method
- Lot specific calibration
- Multiple password protected access levels
- Automatic maintenance information
- Built-in QC modules
- Automatic daily back-up

## QC

- Levey-Jennings and Youden-plot
- Westgard rules

## Calibration

- Single- and multi-calibrators available
- Automatic dilution for multipoint calibration

## Data management and transfer

- ASTM E 1394-87 standard
- Real-time LIS interface
- Bi-directional RS232C
- Windows™ based software
- Export and import of data

## Maintenance

- Remote access option – error log facilitating diagnosis
- Only 5 minutes/day preventive maintenance

Patients

Patient ID: 017432 First Name: Hans Last Name: Kern

Reference Class: Male Birth Date: 22-09-1955

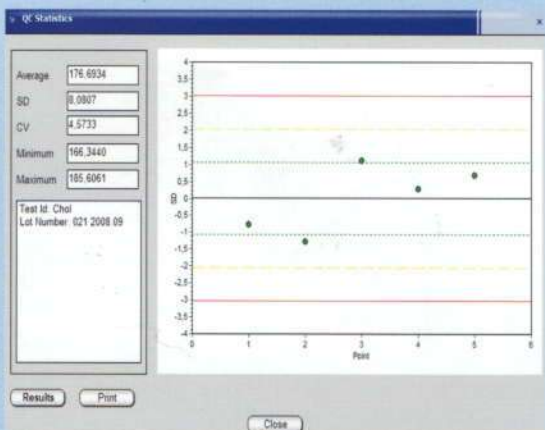
Medical Doctor: Human Medication: All

Section: Marketing Bed: 204 Diagnostics: Nothing

| Sample ID | Type | Test | Status | Result |
|-----------|------|------|--------|--------|
| 16        | Chem |      |        |        |

Buttons: New, Delete, Edit, Delete All

## Patient demographics



## Levey-Jennings plot

Controls

| Date     | Control ID | Lot Number | Test | Scale | Result | Units       |
|----------|------------|------------|------|-------|--------|-------------|
| 27-08-07 | 0001       | 2013.03    | Chem | 4.20  | 4.83   | 6.57 result |
| 28-08-07 | 0001       | 2013.03    | Chem | 4.20  | 4.95   | 6.57 result |
| 29-08-07 | 0001       | 2013.03    | Chem | 4.20  | 4.95   | 6.57 result |
| 30-08-07 | 0001       | 2013.03    | Chem | 4.20  | 4.88   | 6.57 result |
| 31-08-07 | 0001       | 2013.03    | Chem | 4.20  | 4.87   | 6.57 result |

Buttons: Statistics, Control test, Run test, Print, Export, Plot, Details

## Export function

Operations

| Task                     | Actual | Limit   | Last reset date |
|--------------------------|--------|---------|-----------------|
| Front pump cycles        | 800    | 100 000 |                 |
| Back pump cycles         | 180    | 100 000 |                 |
| Front syringe cycles     | 443    | 100 000 |                 |
| Back syringe cycles      | 134    | 100 000 |                 |
| Front dye block cycles   | 862    | 100 000 |                 |
| Back dye block cycles    | 243    | 100 000 |                 |
| ISE number of samples    | 0      | 10 000  |                 |
| Front pump rate cycles   | 908    | 100 000 |                 |
| Back pump rate cycles    | 188    | 100 000 |                 |
| Front cassette dilutions | 848    | 100 000 |                 |
| Back cassette dilutions  | 122    | 100 000 |                 |

Buttons: Results, Print, Close

## Maintenance menu

# SYSTEM REAGENTS & CONSUMABLES

## System reagents

| Enzymes                         | Test    | Tests/kit | Cat. No. |
|---------------------------------|---------|-----------|----------|
| ACID PHOSPHATASE                | 3 x 50  | 150       | 10660600 |
| ALK.PHOSPHATASE opt. liquicolor | 3 x 250 | 750       | 12027600 |
| ALK.PHOSPHATASE liquicolor      | 3 x 250 | 750       | 12117600 |
| alpha-AMYLASE liquicolor        | 3 x 260 | 780       | 12028600 |
| CK-MB liquiUV                   | 2 x 100 | 200       | 12118600 |
| CK NAC activated liquiUV        | 2 x 180 | 360       | 12015600 |
| gamma-GT liquicolor             | 3 x 250 | 750       | 12023600 |
| GOT (ASAT) IFCC mod. liquiUV    | 5 x 310 | 1550      | 12021600 |
| GPT (ALAT) IFCC mod. liquiUV    | 5 x 310 | 1550      | 12022600 |
| LDH SCE mod. liquiUV            | 2 x 180 | 360       | 12014600 |
| LIPASE liquicolor               | 2 x 100 | 200       | 12006600 |
| PANCREAS-AMYLASE liquicolor     | 2 x 100 | 200       | 12009600 |

## Substrates

|                                          |         |      |           |
|------------------------------------------|---------|------|-----------|
| ALBUMIN liquicolor                       | 6 x 150 | 900  | 10560600  |
| auto-BILIRUBIN-D liquicolor              | 5 x 210 | 1050 | 10741600  |
| auto-BILIRUBIN-T liquicolor              | 5 x 210 | 1050 | 10742600  |
| CHOLESTEROL liquicolor                   | 3 x 150 | 450  | 10028600  |
| CREATININE (enzym) liquicolor            | 1 x 300 | 300  | 10053600  |
| auto-CREATININE liquicolor               | 5 x 250 | 1250 | 10052600  |
| GLUCOSE liquicolor                       | 6 x 210 | 1260 | 10260600  |
| HbA1c liquidirect                        | 1 x 135 | 135  | 10770600  |
| HDL CHOLESTEROL liquicolor               | 2 x 180 | 360  | 10084600  |
| HOMOCYSTEINE liquiUV                     | 1 x 250 | 250  | 111406000 |
| LDL CHOLESTEROL liquicolor               | 2 x 90  | 180  | 10094600  |
| TOTAL PROTEIN liquicolor                 | 6 x 210 | 1260 | 10570600  |
| TRIGLYCERIDES liquicolor <sup>mono</sup> | 3 x 210 | 630  | 10724600  |
| UREA liquiUV                             | 5 x 250 | 1250 | 10521600  |
| URIC ACID liquicolor <sup>plus</sup>     | 5 x 250 | 1250 | 10694600  |

## Electrolytes

|                       |         |      |          |
|-----------------------|---------|------|----------|
| CALCIUM liquicolor    | 3 x 430 | 1290 | 10011600 |
| MAGNESIUM liquicolor  | 4 x 60  | 240  | 10010600 |
| PHOSPHORUS liquirapid | 4 x 60  | 240  | 10027600 |
| IRON TPTZ liquicolor  | 2 x 180 | 360  | 12290600 |
| POTASSIUM liquiUV     | 1 x 75  | 75   | 10120600 |
| SODIUM liquicolor     | 1 x 75  | 75   | 10113600 |

## Immunoturbidimetry reagents

| Immunology                | Test    | Tests/kit | Cat. No. |
|---------------------------|---------|-----------|----------|
| COMPLEMENT C3             | 1 x 70  | 70        | 11110600 |
| COMPLEMENT C4             | 1 x 70  | 70        | 11113600 |
| IMMUNOGLOBULIN IgA direct | 1 x 250 | 250       | 11501600 |
| IMMUNOGLOBULIN IgG direct | 1 x 250 | 250       | 11502600 |
| IMMUNOGLOBULIN IgM direct | 1 x 250 | 250       | 11503600 |

## Anemia

|             |        |    |          |
|-------------|--------|----|----------|
| FERRITIN    | 1 x 90 | 90 | 11610600 |
| TRANSFERRIN | 1 x 70 | 70 | 11115600 |

## Lipoproteins

|                            |        |    |          |
|----------------------------|--------|----|----------|
| APOLIPOPROTEIN A1 (APO A1) | 1 x 70 | 70 | 11101600 |
| APOLIPOPROTEIN B (APO B)   | 1 x 70 | 70 | 11102600 |
| LIPOPROTEIN (a), Lp(a)     | 1 x 90 | 90 | 11105600 |

## Inflammatory and rheumatoid tests

|                           |         |     |          |
|---------------------------|---------|-----|----------|
| ANTI-STREPTOLYSIN-O (ASO) | 1 x 210 | 210 | 11251600 |
| CRP                       | 1 x 250 | 250 | 11241600 |
| RHEUMATOID FACTORS (RF)   | 1 x 210 | 210 | 11261600 |

## Kidney diseases

|                        |         |     |          |
|------------------------|---------|-----|----------|
| CYSTATIN-C liquidirect | 2 x 100 | 200 | 11150600 |
| MICROALBUMIN           | 1 x 90  | 90  | 11120600 |



HUMAN – high quality system reagents

## Quality control

### Multi-Level

|                   | Unit     | Cat. No. |
|-------------------|----------|----------|
| <b>HUMATROL N</b> | 6 x 5 ml | 13511    |
| <b>HUMATROL P</b> | 6 x 5 ml | 13512    |

> Control sera on bovine basis

|                 |          |       |
|-----------------|----------|-------|
| <b>SERODOS®</b> | 6 x 5 ml | 13951 |
|-----------------|----------|-------|

|                      |          |       |
|----------------------|----------|-------|
| <b>SERODOS® plus</b> | 6 x 5 ml | 13151 |
|----------------------|----------|-------|

> Control sera from human donors

|                 |          |       |
|-----------------|----------|-------|
| <b>TURBIDOS</b> | 4 x 3 ml | 13010 |
|-----------------|----------|-------|

> Control sera for immunoturbidimetric assays

> 2 levels, high and normal

### Single-Level

|                      |          |       |
|----------------------|----------|-------|
| <b>CK-MB Control</b> | 4 x 2 ml | 13611 |
|----------------------|----------|-------|

|                           |          |       |
|---------------------------|----------|-------|
| <b>CYSTATIN-C Control</b> | 3 x 1 ml | 11153 |
|---------------------------|----------|-------|

|                                   |            |       |
|-----------------------------------|------------|-------|
| <b>HbA1c Control Blood normal</b> | 2 x 0.5 ml | 10775 |
|-----------------------------------|------------|-------|

abnormal 2 x 0.5 ml

|                             |            |       |
|-----------------------------|------------|-------|
| <b>HOMOCYSTEINE Control</b> | 3 x 1.5 ml | 11143 |
|-----------------------------|------------|-------|

## Calibrator / Standards

### Multi-Level

|                |          |       |
|----------------|----------|-------|
| <b>AUTOCAL</b> | 4 x 5 ml | 13160 |
|----------------|----------|-------|

> Multicalibrator for automated analyzers

### Single-Level

|                         |          |       |
|-------------------------|----------|-------|
| <b>CK-MB Calibrator</b> | 2 x 1 ml | 13612 |
|-------------------------|----------|-------|

|                             |            |       |
|-----------------------------|------------|-------|
| <b>HbA1c Calibrator Set</b> | 4 x 0.5 ml | 10776 |
|-----------------------------|------------|-------|

|                                    |          |       |
|------------------------------------|----------|-------|
| <b>HOMOCYSTEINE Calibrator Set</b> | 2 x 3 ml | 11145 |
|------------------------------------|----------|-------|

|                           |          |       |
|---------------------------|----------|-------|
| <b>POTASSIUM Standard</b> | 2 x 3 ml | 10126 |
|---------------------------|----------|-------|

|                        |          |       |
|------------------------|----------|-------|
| <b>SODIUM Standard</b> | 2 x 3 ml | 10114 |
|------------------------|----------|-------|

## Standards for immunoturbidimetric tests

|                                     | Unit       | Cat. No. |
|-------------------------------------|------------|----------|
| <b>ASO Standard</b>                 | 2 x 1 ml   | 11351    |
| <b>APO A1/B Standard</b>            | 2 x 1 ml   | 11104    |
| <b>C3/C4/TRF Standard</b>           | 2 x 1 ml   | 11117    |
| <b>CRP Standard</b>                 | 2 x 1 ml   | 11341    |
| <b>CYSTATIN-C Calibrator Set</b>    | 5 x 1 ml   | 11155    |
| <b>FERRITIN Calibrator 500</b>      | 4 x 0.5 ml | 13020600 |
| <b>IgG, IgA, IgM Calibrator Set</b> | 5 x 2 ml   | 11504    |
| <b>Lp(a) Standard</b>               | 2 x 0.5 ml | 11004    |
| <b>MICROALBUMIN Standard</b>        | 2 x 1 ml   | 11124    |
| <b>RF Standard</b>                  | 2 x 3 ml   | 11361    |

## Consumables

|                          |           |          |
|--------------------------|-----------|----------|
| <b>REACTION CUVETTES</b> | 1200 pcs. | 16661/1  |
| <b>CHIMNEY</b>           | 16 pcs.   | 16660/01 |
| <b>DILUENT</b>           | 4 x 20 ml | 16663/10 |
| <b>CUVETTE CLEAN</b>     | 6 x 55 ml | 16663/20 |
| <b>TIP CLEANING KIT</b>  | 4 x 20 ml | 16663/25 |
| Tip Clean + Tip Rinse    |           |          |
| <b>WASH ADDITIVE</b>     | 4 x 25 ml | 18971    |

## ISE consumables\*

|                             |           |             |
|-----------------------------|-----------|-------------|
| <b>ISE Cleaner</b>          | 6 x 20 ml | 16660/11-01 |
| <b>ISE Urine Diluent</b>    | 4 x 20 ml | 16660/13-01 |
| <b>ISE Tri-Level QC kit</b> | 3 x 10 ml | 16663/40    |
| <b>Na Electrode</b>         | 1 pc.     | 16660/4-01  |
| <b>K Electrode</b>          | 1 pc.     | 16660/5-01  |
| <b>Cl Electrode</b>         | 1 pc.     | 16660/6-01  |
| <b>Ref. Electrode</b>       | 1 pc.     | 16660/7-01  |
| <b>ISE Standard Pack</b>    | 710 ml    | 16660/14-01 |

### ISE Standard Pack reagent consumption

| No. of serum samples per day | No. of samples per ISE Standard Pack |
|------------------------------|--------------------------------------|
| 10                           | 680                                  |
| 30                           | 1380                                 |
| 50                           | 1750                                 |

\*only usable for new ISE module Cat.no. 16663-03

# HumaStar 600 SYSTEM

## Technical data

### HumaStar 600

incl. barcode reader, ISE prepared  
ISE Module Na, K, Cl

Cat. No. 16660  
Cat. No. 16663-03

## Mode

Closed system with 5 open channels  
Random-access or batch mode  
STAT functionality by sample  
STAT functionality in batch mode by reagent  
Automatic sample dilution for abnormal  
Automatic sample pre-dilution and post-dilution  
Auto-Rerun at self-specified limits  
Special work mode for immunoturbidimetric tests

## Throughput

Up to 600 tests/h  
Up to 800 tests/h with ISE

## Analysis

End point with sample or reagent blank  
Kinetic and fixed time measurement  
Mono- and bi-chromatic  
Sample blank compensation

## Calibration

Single and multi-point calibration or factor  
Up to 10 calibrators for multi-point calibration

## Quality control

Levey-Jennings and Youden plot  
Westgard multi rules

## Backup

Automatic backup procedure

## Samples

**Sample volume:** 2 to 100 µl per test (in 1 µl steps)  
**Sample tray:** 95 positions (5 racks x 19 positions)  
Sample barcode for all positions  
Primary tubes up to 13 x 100 mm possible  
Adjustable for pediatric and small sample cups

## Reagents

48 single reagents and 4 with ISE unit  
Up to 3 reagents per method  
5 to 500 µl/test (in 1 µl steps)  
Permanent reagent cooling at 6...8°C  
Substrates, Enzymatic, Turbidimetric

## Reaction

2 x 80 re-usable plastic cuvettes (6mm)  
**Reaction volume:** 180 to 500 µl  
**Reaction temperature:** 37 ± 0.1 °C  
**Reaction time:** 0 to 10 min.

## Pipetting

Needle shock detector  
Liquid level detector  
Clot detector

## Wash Station

6 stage washing unit  
**Water consumption:** < 4 l/hour

## Optical system

Double beam with reference beam  
12 discrete wavelengths (340, 380, 405, 450, 490, 505, 550, 590, 620, 650, 700, 750 nm)  
**Photometric range:** -0.1 to 4.0 A  
Single or double wavelength reading

## ISE unit

### (optional)

Na<sup>+</sup>, K<sup>+</sup>, Cl<sup>-</sup> and Li<sup>+</sup> optional  
Direct ISE measurement of 100 samples/h  
**Sample material:** serum/plasma and urine

## Data-

### management

Windows™ based software  
Data export and import functionality  
**LIS:** ASTM E1394-97 standard, real time, bi-directional

## Printouts

Customer definable reports, optimized printouts of results, work lists, serum list, calibration, quality control etc.

## Environment

Temperature max. 30°C,  
Humidity max. 80% non-condensing

## Power

110/220 V, 50/60 Hz, 1.400 VA  
UPS included

## Dimensions

100 (W) x 74 (D) x 113 (H) cm

## Weight

180 kg