Expert workflow management
cobas p 612 pre-analytical system
Professional management of laboratory processes
Expert workflow management

Concept

Professional management of processes in diagnostic laboratories is recognized as a major contributor for further improvement of laboratory cost and quality position in the market. Roche provides innovative pre- and post-analytical systems in combination with comprehensive IT solutions to support workflow optimization, which results in a beneficial improvement of testing efficiency, service to clinicians and provided patient care. The cobas p pre- and post-analytical family, providing standalone Task Targeted Automation or connected Total Laboratory Automation, including the MODULAR® PRE-ANALYTICS EVO, allows small to very large laboratories to achieve their individual goals concerning workflow efficiency, reduced complexity, flexibility, control and security. The cobas IT solutions provide the frame to realize the full potential of your laboratory set-up and processes as to comply to constantly evolving standards and greater reporting accuracy to enhance patient safety, thus reducing costs.

Workflow efficiency

The fully scalable and easy extendable cobas p 612 pre-analytical Task Targeted Automation system offers a new dimension of productivity for high volume laboratories and contributes to significant overall cost savings and improved quality.

Reduced complexity

It supports streamlined processing with its single point of entry capability, by sorting directly into target analyzer racks, and with a smooth integration into the laboratory IT solution, providing a satisfying work environment.

Flexibility

The tailored solution allows individual workflows while processing various different tube types, height and diameters at the same time with continuous loading and unloading option.
cobas p 612 pre-analytical system

Overview

Control & security
By establishing standard methods the systems are carry-over free, provide fully sample traceability, assure sample integrity, reduce error rates as well as maximizing staff safety.

The cobas p 612 pre-analytical system delivers the following functions:
• Registration of primary tubes by barcode scanning
• Detection of tube type of each primary tube by basic camera function
• Administration of test requests downloaded from the laboratory IT system
• Decapping of primary tubes based on request or rule setting
• Creation of one or more secondary (=aliquot) tubes depending on the rule settings
• Barcode labeling of the aliquot tubes
• Distribution/sorting of primary tubes
• Distribution/sorting of aliquot tubes
• Bi-directional host interface for data exchange

The cobas p 612 pre-analytical system can be extended with the following options
• Laser liquid level detection
• Extended camera system
• Recap unit
• Online connected centrifuge

Option: On-line centrifuge
• Single centrifuge (cobas p 471 centrifuge unit) or
• Double centrifuge (cobas p 671 centrifuge unit)

Option: Laser liquid level detection
• Sample volume recognition through barcode label

Option: Recap unit
• For primary tubes or
• For secondary tubes or
• For primary and secondary tubes

Option: Camera extension
• Tube type identification
• Sample quantity detection
• Sample imaging recording
• Sample quality recognition
cobas p 612 pre-analytical system
At a glance

1 Input area
- Laser liquid level detection (optional)
- Barcode reader
- Camera unit (optional)
- Decap unit
- Lifting gripper
- Rotary gripper

2 Aliquoter
- Secondary tube storage
- Barcode labelling
- Pipetting unit

3 Output (sorting) area
- Recap unit (optional)
- Sorting targets
Barcode reader

Laser liquid level detection

Camera unit

Decap unit

Lifting gripper

Rotary gripper

Secondary tubes storage

Barcode labeling

Pipetting unit

Recap unit

Tube conveyor

Sorting targets

**Input area** (drawer 1-4)  **Aliquoter**  **Sorting area** (drawer 1-8)
Professional management of laboratory processes

Roche’s expert workflow management offers powerful platforms with different levels of automation. The cobas p 612 pre-analytical system is one cornerstone enabling the customer to build up high efficient sample workflows.

Together with the Roche IT environment (PSM / cobas IT solutions) integrated and harmonized solutions can be realized, from order entry to sample archive and result validation. The main highlights and advantages are:

• Powerful sample flow management functions with a rulebased automated decision process from sample arrival to sample archive including sample tracking and fully computer-aided rerun/repeat/reflex test handling
• The further routing of sample tubes within the pre-analytical unit depending on current analytical results
• High user convenience achieved by automation of repetitive, error-prone and bio-hazardous pre- and post-analytical work steps
• State-of-the-art data management modules for quality control management and technical validation of patient results
• Extendable, flexible and scalable platforms. The expert workflow management is highly configurable and can be adapted to most customer requirements
• Consideration of efficient backup solutions for sample handling processing and data management enables an around-the-clock operation
• Support of various platforms and network topologies
• Standardized and function-optimized host interface supports an easy, smooth and fast integration into the laboratory routine

The individual best fit solution is defined in a laboratory analysis, determined according to the specific needs Roche expert laboratory process and organization consultants will help create an efficient, performance-driven laboratory with beneficial improvements in testing efficiency, service to clinicians and provided patient care.
cobas IT solutions/PSM

-cobas p 612 pre-analytical system

-Reception

-Archive

-Other Serum Work Places A…Z

-Decapping

-Sorting

-Aliquoting

-Archiving

-Elecsys® 2010 / cobas e 411 analyzer

-COBAS INTEGRA® 400 plus

-cobas® 6000 analyzer series

-cobas® 8000 modular analyzer series

-Primary

-Aliquots

• Hematology
• Coagulation
• Urinalysis

Sample of workflow management
Functions and features

Input area

Tubes can be put into the input area in any order. Presorting according to tube diameter, tube height, cap color, open/closed, etc. is not required.

The main characteristics of the input area are:
- Max. sample capacity: up to 600 tubes
- Parallel processing of most of the established hematology, coagulation, serum, plasma and urine tubes
- Continuous loading of sample tubes during routine operation
- STAT handling capabilities
- Turning of tubes into a target dependent “good to read” position
- 4 configurable input drawers
- The input drawers are freely definable with in total up to 30 targets
- The following Roche sample carriers are supported:
  - **cobas® 6000 tray with Hitachi 5 position rack**
  - **cobas® 8000 tray with Hitachi 5 position rack**
  - Elecsys® 2010 / Roche/Hitachi 917R / COBAS INTEGRA® 800 tray with Hitachi 5 pos rack
  - **MODULAR ANALYTICS** tray with Hitachi 5 position rack
  - COBAS INTEGRA® 400 tray with 15 position rack

In addition support is provided for:
- Several neutral racks
- Several Sysmex trays with 10 pos rack
- Different centrifuge buckets
- Others*

Decap unit

The decap unit removes the tube cap with a twist and pull motion to prevent build up of aerosols.

The following listed features are just a few examples of the cobas p 612 pre-analytical system decap unit:
- Different tube types (various closure types and tube dimensions) can automatically be decapped in one run
- Tubes do not need presorting
- Support of selective decapping according to user defined rules

* Generally the cobas p 612 pre-analytical system is able to handle non-Roche racks. Please contact your local Roche representative for details.
Recap unit (optional)
The cobas p 612 pre-analytical system can be equipped with a recapper. Selective, target specific recapping of plastic tubes based on user defined rules can be configured. For accurate tube sealing, the tube type information detected by the standard camera unit is forwarded to the recapper. Either the primary or aliquot tubes** can be closed. The following additional functions and features are provided by the recap unit:
- sealing of the tubes with an aluminum foil
- support of various tube diameters (between 11.5 mm and 15.5 mm) and various tube heights (between 65.5 mm and 102.5 mm)

Laser-LLD (optional)
The cobas p 612 pre-analytical system can be equipped with a laser for liquid level detection. This feature will allow detection of the liquid level through a completely closed tube (e.g. barcode label covering the entire perimeter of tube). The Laser-LLD measurement takes place very early in the process, therefore allowing to use the liquid level information as a decision making factor for further processing of the tube.

** or primary and aliquot tubes.

Option: On-line centrifuge
- Single centrifuge (cobas p 471 centrifuge unit) or
- Double centrifuge (cobas p 671 centrifuge unit)

Option: Recap unit
- For primary tubes or
- For secondary tubes or
- For primary and secondary tubes

Option: Laser liquid level detection
- Sample volume recognition through barcode label

Option: Camera extension
- Tube type identification
- Sample quantity detection
- Sample imaging recording
- Sample quality recognition
Functions and features
Aliquoter

The basic function of the aliquoter unit is the reproduction of the required number of secondary tubes from the primary tube based on user configurable rules. The basic components of the aliquoter unit are:

- **Secondary tube storage**
  The secondary tubes are inserted already pre-packed into the secondary tube storage
- **Barcode printer with label applicator**
  - A barcode printer with thermal transfer printing method is used
  - The barcodes (type, length, check digit) to be printed is configurable. The following common barcode types are supported:
    - 2 of 5 interleaved, Code 39, Codabar, Code 128, Codabar/NW7*
  - Besides the barcode, additional information (e.g. other sample or patient information provided by the laboratory information system) can be printed on the label in human readable characters
  - The printed barcode label is placed on the secondary tube
  - Crosscheck of the secondary barcode with the primary barcode. In case of mismatch the affected tubes are sorted out

Pipetting

Pipetting unit and input of disposable tips.
The pipetting unit is characterized by the following features and functions:

- The pipetting process is performed specifically to each sample tube
- The pipetting process is carry over free due to the use of disposable tips
- Up to 28 secondary tubes can be created from one primary tube
- Up to 384 disposable tips on board in 4 trays
- Support for multiple aspirations and dispensions

* **Note: The disposable tip is not exchanged in the case of multiple sample uptake**
- The pipetted volume is calculated based on the single test requests or based on fixed volume assigned to the sorting target
- Clot detection is possible during the material aspiration. If the tube is affected, an error handling process can be defined
- Liquid level detection

* Other bar code types on request
Output (sorting) area

All tubes (primary as well as secondary) are sorted into the output area. The sorting is done according to configurable sorting criteria. The main characteristics of the output area are:

- Max. sample capacity: up to 1,200 tubes
- Up to 8 configurable output drawers
- In total up to 41 sorting targets can be defined
- Parallel sample sorting, aliquoting and archiving can be performed (recursive workflow)
- The system can be configured to turn the primary tube between 0 and 360 degrees before placing it into the target rack
- Drawers (filled or partly filled) with racks can be changed while the system is running
- The following Roche sample carriers are supported:
  - cobas® 6000 tray with Hitachi 5 position rack
  - cobas® 8000 tray with Hitachi 5 position rack
  - Elecsys® 2010 / Roche/Hitachi 917R / COBAS INTEGRA® 800 tray with Hitachi 5 position rack
  - MODULAR ANALYTICS tray with Hitachi 5 position rack
  - COBAS INTEGRA® 400 tray with 15 position rack

In addition support is provided for:

- Several neutral racks
- Several Sysmex trays with 10 position rack
- Different centrifuge buckets
- Others*

* Generally the cobas p 612 pre-analytical system is able to handle non Roche racks as well. Please contact your local Roche representative for details.
Functions and features

Standard camera / TTI camera
The cobas p 612 pre-analytical system is equipped with a CCD camera unit. The camera provides the following basic functions and features:
• The cap color* and tube dimensions are measured
• Detection if the tube is closed or opened
• The cap color is used to distinguish between tubes with the same tube dimensions
• Liquid level detection (via conductive tip)
• Processing of the different types of tubes (hematology, coagulation, serum, plasma and urine tubes) according to rules based on the received test requests
• Up to 20 different tube types (various closure types, tube dimensions, cap colors) can be processed in one run
• Positive verification between bar code with material identification and applied tube type*. In the event of mismatch appropriate error handling procedures can be configured
• Support of bar code alignment
• Forwarding of the tube type information to the decap, aliquot and optional recap unit

* Only available with TTI option
Host interface
The ASTM host interface of the cobas p 612 pre-analytical system allows fast integration into the laboratory routine. The connection can be realized as serial or network. The function set of the ASTM communication protocol has been extended in the new generation systems. Optionally, these extensions allow to execute the distribution rules on the connected IT system. As in this mode the internal cobas p 612 pre-analytical system rules engine is disabled any distribution related configurations are not longer required on cobas p 612 pre-analytical system.

The connection of cobas p 612 pre-analytical system to the Roche IT environment is optimized and a cornerstone for building up efficient and flexible process solutions as sample flow decisions can be combined with current and historic patient and sample data information.

Remote service and support
cobas p 612 pre-analytical system can be serviced remotely. Configuration changes, instrument communication traces and software updates can be carried out via modem access.

Multilanguage support
The cobas p 612 pre-analytical system currently supports the following languages:
• English  • German  • Italian
• Portuguese  • Spanish  • French
other languages on request
Technical specifications  
cobas p 612 pre-analytical system

<table>
<thead>
<tr>
<th>Catalogue numbers</th>
<th>Specifications</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Basic system options</strong></td>
<td><strong>Specifications</strong></td>
</tr>
<tr>
<td>cobas p 612 pre-analytical system</td>
<td>Throughput: Up to 1,100 tubes per hour (decapping and sorting with TTI camera)*</td>
</tr>
<tr>
<td>Primary recap unit for cobas p 612 pre-analytical system</td>
<td>Sample identification: Positive sample identification via bar code; able to handle most of the standard bar code formats such as Interleaved 2 of 5, Code 39, Codabar (NW 7), Code 128, others**</td>
</tr>
<tr>
<td>Secondary recap unit for cobas p 612 pre-analytical system</td>
<td>Sample tube: Accepts most 3, 5, 7 or 10 mL plastic tubes</td>
</tr>
<tr>
<td>Primary and secondary recap unit for cobas p 612 pre-analytical system</td>
<td>Able to open sample tubes with hemogard, rubber stopper or screw cap type closure</td>
</tr>
<tr>
<td>Extended camera</td>
<td>Aliquot tips: Use of disposable pipette tips for secondary tube generation: 1,100 μL volume conductive or 1,000 μL volume non conductive 384 tips on board in 4 tip racks</td>
</tr>
<tr>
<td>cobas p 612 pre-analytical system</td>
<td>Secondary tube: Sarstedt secondary tube 13 x 75 mm</td>
</tr>
<tr>
<td>TTI camera for tube type identification</td>
<td>Twin Tube (FBT) 15 x 95 mm</td>
</tr>
<tr>
<td>QS1 sample quantity</td>
<td>Dimensions: Width: approx. 3.18 m (125&quot;)</td>
</tr>
<tr>
<td>QS1 sample quantity and sample image</td>
<td>Depth (with touch screen): approx. 1.86 m (73&quot;)</td>
</tr>
<tr>
<td>QS1 sample quality (incl. sample quantity and sample image)</td>
<td>Height (incl. signal lamp): approx. 2.00 m (78.7&quot;)</td>
</tr>
<tr>
<td>Laser-LLD (incl. TTI)</td>
<td>Weight (with options): approx. 1,202 kg (2,650 lbs)</td>
</tr>
<tr>
<td>Laser-LLD (incl. QS1)</td>
<td>Operating conditions: For indoor use up to 2,000 m above sea level</td>
</tr>
<tr>
<td>Sealing foil (9 x 500 foils)</td>
<td>Operating temperature: +15°C to +30°C (+59°F to +86°F)</td>
</tr>
<tr>
<td>Tips – conductive 1,100 μL (9,600 pre-packed tips)</td>
<td>Air conditions: 80% max. relative humidity</td>
</tr>
<tr>
<td>Sarstedt secondary tube 13 x 75 mm</td>
<td>Compressed air: Dry and oil free, min 6.0 bar (87.02 psi), max 8.0 bar (116.03 psi)</td>
</tr>
<tr>
<td>Twin Tube (FBT) 15 x 95 mm</td>
<td>Consumption approx. 53.0 l (14.0 gals) per min (with recap unit)</td>
</tr>
<tr>
<td>384 tips on board in 4 tip racks</td>
<td>Maximal power consumption: 230/115 V, 50–60 Hz, 1,800 VA (with recap unit)</td>
</tr>
<tr>
<td>Safety marks: CE, UL</td>
<td>Interface: ASTM protocol</td>
</tr>
<tr>
<td>Network connection via TCP/IP or serial connection via RS 232</td>
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</tbody>
</table>

* The final throughput depends on different parameters as for example the aliquot volume or the number of aliquots per primary tube
** Other bar code types can be checked on request