

**TOSHIBA**  
Leading Innovation >>>

Automated Biochemical Analyzer

TBA-2000FR



**TOSHIBA MEDICAL SYSTEMS CORPORATION**

<http://www.toshibamedicalsystems.com>

©Toshiba Medical Systems Corporation 2011 all rights reserved.  
Design and specifications subject to change without notice.  
Model number: TBA-2000FR MCACL0008EA 2011-02 TMSC/D

Toshiba Medical Systems Corporation meets internationally recognized standards for Quality Management System ISO 9001, ISO 13485.

Toshiba Medical Systems Corporation Nasu Operations meets the Environmental Management System standard, ISO 14001.

Made for Life, TBA are trademarks of Toshiba Medical Systems Corporation.

Printed in Japan



## Reliability

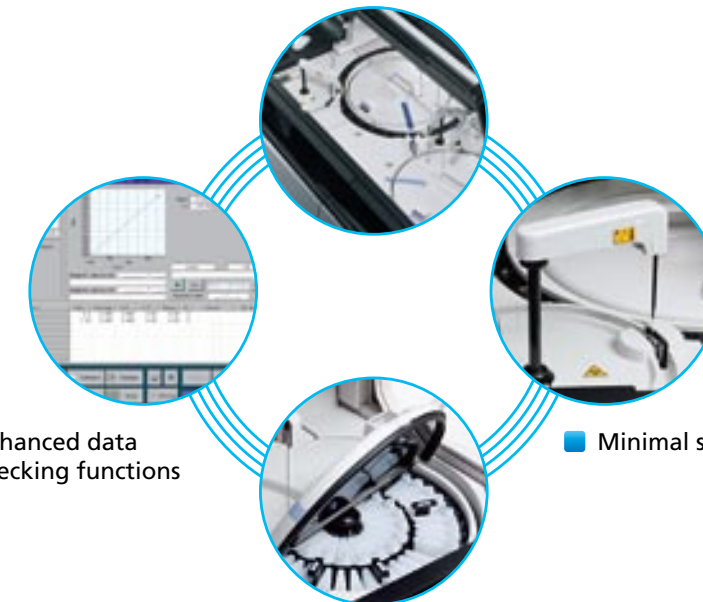


### Designed to ensure high data precision

Based on its outstanding achievements and many years of experience in the manufacture of automated biochemical analyzers, Toshiba has developed the TBA™-2000FR, which represents a new concept in ultimate functionality.

In addition to the incorporation of high-precision units that have proven themselves in previous models, the TBA-2000FR provides high reliability, stable data precision, and safety-conscious design, including an enhanced data checking function, minimal sample carry over, and cover open/closed sensors.

■ Incorporating the high-precision units of previous models



■ Enhanced data checking functions

■ Minimal sample carryover

■ Open/closed sensors for the top cover, reagent carousel covers, and STAT position cover

# TBA-2000FR

## Simple



### Optimized to ensure simple operation

Ensuring that highly reliable data is obtained by simple operation... This concept has been realized in the sophisticated design of the TBA-2000FR. Simplified calibration and control measurement using barcodes, urgent sample measurement on the rack sampler and at the STAT position, an integrated multi-ion sensor for easy maintenance, and many other user-friendly features are provided to ensure efficient and accurate analysis.



# TBA-2000FR

# Ecology



## Developed to ensure a low environmental impact

Effectively utilizing space, reducing waste, and minimizing negative impact on the environment...

The TBA-2000FR incorporates many environmentally friendly features. It is an earth-friendly system that has been developed based on a wide range of ecological considerations, including a compact and space-saving design and the extensive use of recyclable materials.



■ Integration of the console and the analyzer module



■ Shift from air to sea transport for exported systems to reduce CO<sub>2</sub> emissions

■ Materials selected to promote recycling  
(reduced use of resin materials)

■ Molded hard-glass reaction cuvettes

# TBA-2000FR

# Extremely Smooth

The sample racks and trays can be set safely and smoothly on the rack sampler on the front of the system. High sample throughput is ensured by simple operation.

## The rack sampler is on the front of the system to increase measurement efficiency.

The rack sampler on the front of the system allows the user to open the sampler cover and add samples even while measurement is being performed. The rack sampler can be accessed without opening the top cover of the analyzer module, and samples can be set safely and with no danger of being hit by the sampling arm or other moving parts.

### ■ Samples are recognized reliably by double-checking

The cup sensor detects the presence of a sample cup and sample tube, and the barcode reader then reads the sample IDs to identify the samples with high reliability.

### ■ Completion of sampling can be confirmed at a glance

Racks for which sampling has been completed are moved to the left end of the sampler. This allows the user to easily confirm that sampling has been completed before removing the samples.



Set the tray on the rack sampler and start measurement.



The rack at the left end is loaded into the analyzer, and the cup sensor recognizes the samples. The barcode reader then reads the sample IDs.



The rack is moved to the left and sampling is performed.

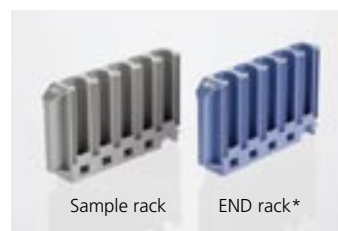


Racks for which sampling has been completed are pushed out of the analyzer and moved to the left end of the sampler.



## Racks and trays

The racks (each of which can hold up to 5 samples) are placed on trays and set on the sampler. Up to 10 racks can be placed on a tray, and up to 4 trays (200 samples) can be set on the sampler.



Rack: 5 samples

Tray: 10 racks

\* The END rack is set at the final position of the racks and allows quick measurement of additional samples.

## Sample containers

Sample tubes of various sizes and sample cups can be used in combination.

# Extremely Flexible

The TBA-2000FR supports simplified calibration and control measurement using barcodes and flexible urgent sample measurement, ensuring efficient analysis.

## Calibration and control measurement using barcodes

Calibrators and controls can be measured by simply placing sample cups containing the calibrators or controls on top of sample tubes to which dedicated barcodes have been applied and setting them in the sample rack. This minimizes screen operations and increases efficiency in daily operation.

## Support of urgent sample measurement with the rack sampler and STAT position

An urgent sample can be measured without delay by replacing a rack on the rack sampler with a rack containing the urgent sample or by setting the sample at the dedicated STAT position.

### ■ Sample replacement on the rack sampler

The racks on the rack sampler are drawn into the analyzer immediately just before sampling. An urgent sample can be measured with high priority by simply replacing the rack to the right of the drawing position with the rack containing the urgent sample.

### ■ STAT position for processing a STAT sample with top priority

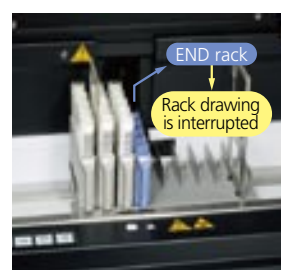
A STAT position for urgent samples is provided. Sample barcode reading is possible at this position, and measurement is performed immediately for the sample set at the STAT position, interrupting sampling of the routine samples in the other racks. The tray open/close sensor at the STAT position allows STAT samples to be set safely by preventing interference with the sample arm.



STAT position

## Quick and easy setting of additional samples

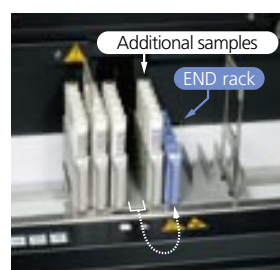
The END rack that interrupts rack drawing and the RESTART switch allow additional samples to be set with ease. This feature minimizes user operations.



Rack drawing is interrupted when the system detects the END rack.



Set the rack containing additional samples and move the END rack to the right of the newly added rack.



Press the RESTART switch to resume measurement.



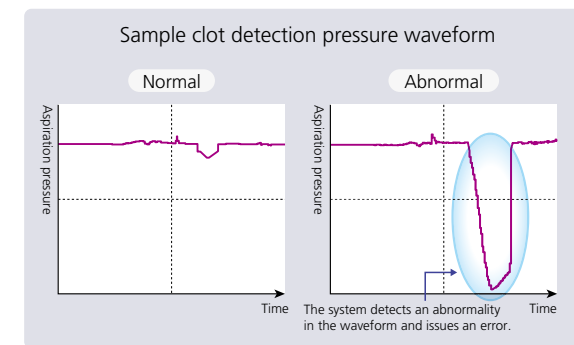


# Extremely Precise

The TBA-2000FR incorporates various functions to ensure that highly precise data is consistently obtained. Its extremely reliable analysis results satisfy a wide range of clinical needs.

## Sample clot detection function provided as standard

The sample clot detection unit monitors the pressure during sample aspiration and dispensing and detects any abnormalities in the pressure waveform. If cloggings in the sample probe due to fibrin and other obstacles are detected, an error is output and the sample probe is washed automatically. Sampling of the next sample is started when the pressure returns to normal levels.

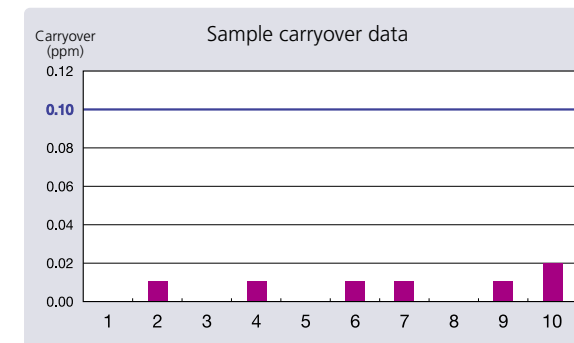


## Sample carryover reduced to 0.1 ppm or less

Sample carryover is reduced to 0.1 ppm (1/10,000,000)<sup>\*1</sup> or less by the enhanced sample probe wash operation. It is no longer necessary to divide a sample into small portions for use in an immunoassay system.

\*1: For example, even when a negative sample containing 0 IU/mL of HBs antigen is measured followed by a sample containing 100,000 IU/mL of HBs antigen, the result for the negative sample will be 0.01 IU/mL of HBs antigen or less.

\*2: Consult with the manufacturer of each immunoassay system for the level of sample carryover that is considered to be clinically acceptable.



## Highly efficient reagent carousels that permit the use of different bottle sizes in combination

The double-turntable reagent carousels ensure highly efficient reagent dispensing. It is possible to set reagent bottles of various sizes in combination.<sup>\*1</sup> The reagent carousel cover open/close sensor prevents the reagent probes from hitting the cover.

- Reagent bottle sharing, reagent bottle changeover
- Each of the two reagent carousels can accept up to 65 reagent bottles<sup>\*2</sup>
- All reagent bottle positions are refrigerated, and universal reagents are supported.

\*1: 100, 90, 70, 55, 50, 20 mL (round type, 70-mL type, 55-mL type)  
\*2: When the reagent rack for 55-mL bottles is used



## Photometry with a minimum final reaction volume of 80 µL

The minimum required reaction volume for undiluted samples is reduced, which also reduces the amount of reagent required. In addition, this feature provides improved data precision, extending the range of applications.

# Extremely Efficient

The TBA-2000FR is the realization of Toshiba's many years of expertise in automated biochemical analyzers. High-order integration opens up many new possibilities.

## Toshiba's original electrolyte measurement unit installed as standard

Toshiba's original integrated multi-ion sensor can simultaneously measure three electrolytes ( $\text{Na}^+$ ,  $\text{K}^+$ ,  $\text{Cl}^-$ ) in serum or urine and is designed for easy maintenance. The Smart Report function displays the measurement results as soon as they become available.



## Vibration-type piezoelectric stirrers for effective mixing of the reaction liquid

High-performance vibration-type stirrers with piezoelectric elements are used to mix the reaction liquid effectively. The stirrers cause the liquid to move up and down in the reaction cuvette, ensuring that it is thoroughly mixed. In addition, the stirrers have a simple design for easy maintenance.



## Molded hard-glass reaction cuvettes with high washing efficiency

The TBA-2000FR uses molded hard-glass reaction cuvettes that can be washed effectively. After measurement, the reaction cuvettes are washed thoroughly with two different types of detergents and deionized water before they are used for the next sample. In addition, a cuvette blank is measured before sample measurement, and cuvettes with a cuvette blank value higher than the specified value are skipped automatically, with a beep to indicate an error. The high durability of the reaction cuvettes reduces the need for periodic replacement and minimizes waste.



## Commitment to developing environmentally friendly products

The TBA-2000FR is designed to be environmentally friendly, and its structural components have been carefully selected to minimize negative impact on the environment and waste generation. The system is based on environmentally conscious product development concepts that aim to promote the most effective use of resources, to reduce the use of potentially harmful substances, and to avoid contributing to global warming.

## Thorough reaction cuvette washing with the washing unit

After measurement, the reaction cuvettes are washed thoroughly with two different types of detergents (alkaline and acid) and deionized water before they are used for the next sample. The detergent bottles can be set in the system as is because the detergents are diluted automatically, saving time and effort.



## OSS\* function to minimize reduction in the processing speed

The carryover pair program includes additional washing processes and consequently reduces the effective processing speed. To minimize this effect, the OSS function automatically rearranges the sampling sequence to reduce the number of times the carryover pair program needs to be executed.

\* OSS : Optimized Sampling Sequence





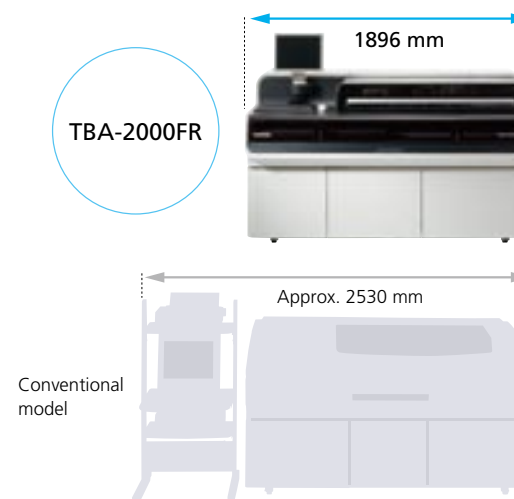


# Extremely Smart

Smart functions are implemented in a compact unit. The TBA-2000FR supports user-friendly and powerful functions in daily operation.

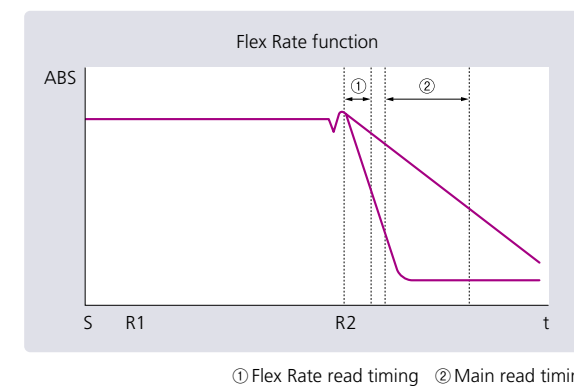
## Space-saving design by integrating the control console with the analyzer module

The console, which is separated from the analyzer module in conventional models, is integrated with the analyzer module for further space saving. The combination of an easy-to-operate LCD monitor with a touch panel and a mouse for detailed setting improves user friendliness.



## Flex Rate function for reducing the retest ratio

For high-concentration samples that require retesting after dilution, the Flex Rate function calculates the concentration based on the absorbance data in the early stages of the read timing and reports the result. This minimizes the retest ratio and consequently reduces the reporting time and operating costs.



## Assay View screen for confirmation of calibration curves

The system can store calibration curves for the last 31 days. This allows the user to compare the current calibration curves with the previous curves on the same screen for confirmation. In addition, the calibration data can be displayed in graphical form, which is useful for checking for variations in reagent blank data or calibrator data.



## Recalculation using different conditions

The system stores the absorbance data for all 16 wavelengths, and the measurement results can therefore be recalculated easily after the assay parameters or calibration curve are changed. This is also useful when evaluating a new assay.

## Automatic startup/automatic shutdown

The system can be automatically started up and shut down at scheduled times. It is also possible to set the system so that the power is turned off automatically after shutdown.

## External data output to a USB flash drive

The measurement results, absorbance data, QC data, assay parameters, etc. can be exported to a USB flash drive.

