PCR Thermal Cycler

Simply the Best in PCR

The Biometra Thermal Cycler Family

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An Endress+Hauser Company

Biometra Thermal Cycler Family

Analytik Jena's Biometra thermal cycler family provides outstanding PCR technology.

The Biometra thermal cycler family offers a range of high-quality models to meet individual user needs.

The **Biometra TOne** is a high-performance system with a 96-well block, also available with a gradient function. The combination of excellent technical data and an attractive price makes it the right choice for many research and routine laboratories.

Users looking for a premium system will find their desired device in the **Biometra TAdvanced.** Its features include the combination of ultra-fast heating and cooling rates, the wide range of exchangeable block modules and the professional user management system.

The **Biometra TRIO** thermal cycler includes three independent blocks in one instrument. Both multiuser environments as well as users with lower sample numbers but different samples will enjoy this model. The three-block design and the specific Temperature Optimization Step function support the fast optimization of ideal annealing temperatures.

Biometra TRIO

Biometra TAdvanced Twin

Unique features of the Biometra thermal cycler family:

- **Fast Ramping, Best Accuracy, Block Control (RAC):** What you set is what you get
- **High-performance Smart Lid (HPSL):** Defined pressure control for highly reproducible results
- **Whisper Quiet:** Low noise emission of max. 45 dB
- **Linear Gradient Tool:** For easy gradient programming to identify the ideal annealing temperature

Biometra Thermal Cycler Family

Simply the Best in PCR

Biometra TAdvanced

Biometra TOne

Quality and High Performance in PCR

Tradition plus innovation: Analytik Jena can look back on a long tradition of developing high-quality, highly precise analytical systems. The Biometra thermal cyclers stand for high-performance sample blocks. Amplification results are always excellent and reliable with ideal reproducibility.

The premium "Made in Germany" quality

All instruments are "Made in Germany" and developed to meet the highest standards in reliability, precision and block uniformity in the long term. Use of these instruments guarantees accurate and consistent results. All instruments come with a 7" color touch screen and an easy-to-use software interface. Users can choose between different programming modi, templates and a quick-start list.

Fast Ramping/Highest Accuracy/Block Control

Fast Ramping: Thanks to the modern electronics, Biometra thermal cyclers reach high heating and cooling rates of up to 8 °C/sec, depending on block type.
Block Control: The Biometra thermal cyclers control the sample block temperature without under- or overshooting the programmed target temperature. This reflects our philosophy that the instrument exactly does what the user has programmed it to do. The ingenious temperature control system incorporated into our **RAC (Ramping – Accuracy – Control)** technology maximizes experimental reproducibility and achieves outstanding accuracy in temperature control.

The perfect block seal

High expections for long-term reliability and robustness are met with the well-thought-out design and assembly: The sample block is perfectly sealed to prevent condensation from coming into contact with either the peltier elements located below the sample block or with other electronic components. The seal safely protects the peltier elements and extends the lifetime of the instrument.

Your Benefits

- Short protocol run times thanks to excellent heating and cooling rates
- Valid results due to superior temperature uniformity
- Reproducible conditions independent of the sample volume
- Best match between set and real data, since the reaction mix asymptotically reaches the set target temperature
- Ideal protection from corrosion and condensation

Intelligent and Precise in Detail

A Biometra thermal cycler is not only a thermal cycler, it is a partner for day-to-day routine work as well as for complex PCR optimizations. Therefore each detail matters.

High-Performance Smart Lid (HPSL)

The heated lids of the Biometra thermal cyclers are equipped with **HPSL** technology. An integrated slip clutch always maintains constant contact pressure, regardless of shape and height of the plastic ware. This optimizes the contact between the sample block well and the walls of the plastic ware, resulting in reproducible conditions. A rubber seal in the lid encapsulates the space surrounding the sample block. This closed space increases the sample block temperature uniformity and prevents condensation formation during the final PCR cooling step. A short equilibration period during the first heating of the lid also contributes to a completely balanced atmosphere above the sample block.

Automatic lid-opening mechanism

The Biometra thermal cyclers comes with a one-touch opening mechanism – just press the locking mechanism, and the lid opens. A spring mechanism holds the lid in the open position, preventing it from dropping down. The locking mechanism automatically engages when the operator closes the lid.

Whisper Quiet

The airflow of the Biometra thermal cyclers is optimized to keep the maximum noise level of the instrument down to extremely low 45 decibels. This efficient airflow system also means that the cyclers take up very little space.
In addition to the compact footprint only a small clearance zone of just 10 cm for sufficient airflow is required – much lower than that of other thermal cyclers.

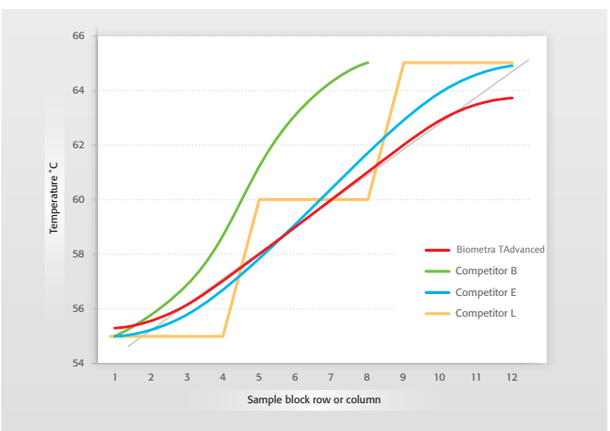
Your Benefits

- Reproducible and consistent results
- Quiet operation with efficient airflow
- Small effective footprint

Gradient function: The intelligent way to program a gradient

Determining the optimum annealing temperature is a challenge when creating a new primer pair.
The Biometra Linear Gradient Tool facilitates to find the optimum temperature under experimental conditions: After entry of an annealing temperature for the block center the desired temperature increment for the gradient is programmed. The specific block design and electronics realize a near linear temperature gradient along the long side of the block for maximum usefulness of the gradient results.

This feature is available for Biometra TOne and best for Biometra TAdvanced with widest linear range.



The graph below shows temperature curves for a sample block with a gradient ranging from 55 °C to 65 °C at increments of 1 °C per row.

Your Benefits

- Free setting of the temperature increment
- Easy programming of even-numbered temperature values

Dedicated Software for Intuitive Programming

Creating new PCR protocols can take a long time if all parameters for every step need to be set manually. Biometra thermal cyclers boast several features for easy programming and intuitive handling.

Program templates

The Biometra thermal cyclers come with pre-installed program templates, compatible with the specific sample block. These templates can be directly used for application or can be easily adapted for the current experiment.

Multi-step programming

The multi-step programming feature allows users to edit all parameters for every program step within a single screen. This helps to create and edit complete programs quickly in one screen.

PCR Control App

A smart control of cyclers, connected to a network, is possible via software application for smartphones or tablets. Available features are such as: live monitoring of PCR program runs, start and stop of PCR protocols, store or copy run protocols, readout of parameters and messages.

PCR Control App
Available for iOS and Android systems

Quick-start list

There are two options for finding programs quickly:

1. Users can check a program in the program preview before starting it.
2. The user-specific quick-start feature lists the five latest started programs.

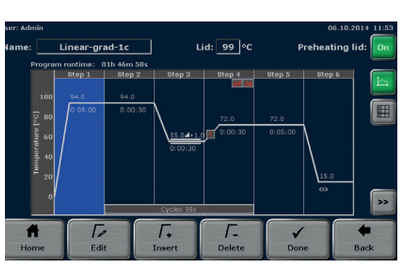
Extended self-test

Users are always on the safe side: On a regular basis or based on individual need, an extended self-test can be carried out to check all relevant features such as cooler, heating, cooling rates and more. All results are stored in a report and can be shared with the technical service.

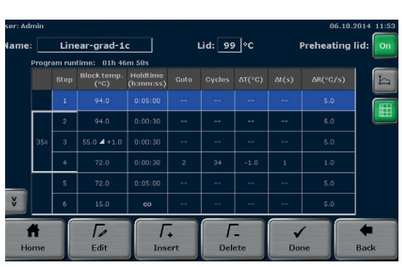
Direct spreadsheet and graphical programming

PCR programs can be edited very quickly by direct easy spreadsheet or graphical programming. Just touch the parameter to be modified, enter the desired value and confirm your settings.

All fields for the input of program parameters are shown in one single screen. One touch leads from the easy spreadsheet to the alternative graphical programming mode.



Graphical programming interface



Spreadsheat programming interface

Advanced User Comfort

An extra-high level of user comfort is offered by the Biometra TAdvanced and the Biometra TRIO thermal cyclers.

Protocol Wizard

The Protocol Wizard enables specific PCR programs to be created by entering just a few inputs. It is based on program templates for specific polymerases. Up to eight different polymerases program templates can be saved in the software and only the annealing temperature, cycle number and product length must be filled in to create a specific PCR program. Furthermore, the Protocol Wizard includes a primer annealing temperature calculator and the calculated Ta value can be used for protocol creation. In conclusion, the Protocol Wizard is an easy-to-use tool for fast protocol creation.

With direct spreadsheet or graphical programming – used in combination with Multi-step Programming, the Protocol Wizard and pre-installed templates – editing of PCR programs has never been faster or easier.

- All parameters in one screen
- Includes a primer annealing temperature calculator
- Toggle between programming modes quickly

Advanced User Management

Both Biometra thermal cycler softwares can manage up to 90 user accounts with three standard user levels available: administrator, users with generic rights and users with limited rights. A convenient menu allows the administrator to configure settings for each user individually by either activating or deactivating specific rights.

Access to the instrument can be limited to authorized personnel – avoiding unwanted changes to system settings and PCR protocols – by applying the user administration tool in combination with the password protection of user accounts. If you do not wish to use the administration feature, you can deactivate the tool in the software.

- Three different user groups with default rights
- Rights can be set individually for each user
- User administration can be switched on or off

GLP conformity

In addition to retaining run log files (exported for long-term archival), the Biometra thermal cyclers also document PCR runs by saving error messages and results from the initial and extended self-test. The documentation tools in combination with Advanced User Management allow GLP-compliant operation.

- Extensive tools for documenting PCR runs
- External archival option
- Access rights can be configured individually

Biometra TOne

Discover optimal amplification performance. Like all members of the Biometra thermal cycler family, the Biometra TOne comes with the well-known, reliable quality. What's more, the ideal price-to-performance ratio makes it affordable for every user.

The Biometra TOne comes with a winning combination of features. Superior sample-block temperature control guarantees fast and reliable results, which is important for routine laboratories as well for advanced amplifications. Thanks to its up-to-date electronics, the Biometra TOne can reach high heating rates of up to 4 °C/s.

Programming protocols is made easy with pre-installed templates and user-friendly interfaces for graphics and spreadsheets. The gradient tool lets the user program a temperature gradient as linearly as possible.

The device is a pleasure to use, with its ergonomic design featuring a large 7-inch color touch screen, an automatic opening mechanism, and direct access to the sample block.

Thanks to its optimized airflow, the machine produces exceptionally little noise, even when running at maximum performance. Users can easily run several Biometra TOne thermal cyclers in a laboratory simultaneously while working next to them without being disturbed.

Your Benefits

- Suitable block format for typical standard applications: 96-well with gradient option
- Short protocol run times thanks to excellent heating and cooling rates
- Best reproducibility due to superior temperature uniformity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Biometra TAdvanced

No compromises in technology. This model stands for superior technology and premium “Made in Germany“ quality.

This premium model combines all important features in one instrument. It meets the highest requirements for speed, accuracy, and temperature uniformity while fulfilling many varied application needs. Optimizing PCR protocols is made extra easy with the Protocol Wizard. It includes a primer annealing temperature calculator. Using its unique gradient tool, temperature gradients can be set over a wide range as linearly as possible.

High-speed silver or aluminum block

Thanks to new electronic developments, the Biometra TAdvanced can reach maximum heating rates of 6 °C/s in an aluminum block – rates that so far have only been able to be achieved with a silver block. For even higher heating rates up to 8 °C/s, a 96-well silver block is available. Because silver conducts heat so well, this block adapts to temperature changes quickly, maximizing speed and achieving outstanding temperature uniformity. The surface of the premium silver block is coated with a layer of gold to protect it from corrosion.

Quick Block Exchange (QBE)

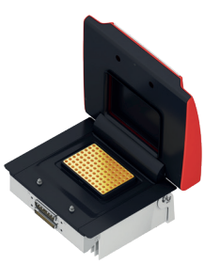
The Biometra TAdvanced thermal cycler is available with different block formats. Thanks to QBE technology, the block modules can be exchanged in a few seconds.

Block variety

A variety of block modules is available to meet all customer needs. Most of the sample blocks have the option to be equipped with the gradient function.

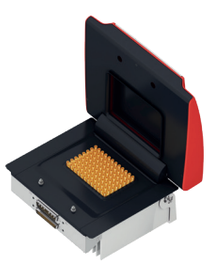
Your Benefits

- Maximum flexibility for switching user requirements, with a single handle
- Automatic detection and installation for block modules
- Easy block exchange – no tools required
- Wide choice of blocks: from single to twin block modules, with a gradient option



96-well silver-block module

For highest demands in speed and uniformity

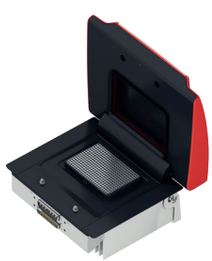


96-well aluminum-block module

Perfect for standard PCR applications

60-well aluminum-block module

For very high reaction volumes in 0.5 ml tubes



384-well aluminum-block module

Designed for low-reaction volumes

Twin-block modules

Offer the highest application flexibility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Biometra TRIO

Triple powered PCR. The Biometra TRIO provides three independent sample blocks that can run three different PCR reactions simultaneously. The Biometra TRIO represents a unique premium instrument. It's ideal for optimizing primer annealing temperatures, which is crucial for specific and efficient PCR reactions.

Three independent thermal cyclers in one housing

The Biometra TRIO thermal cycler provides three independent blocks and heated lids in one housing. Thanks to the multiblock technology, three different protocols can run at the same time. The Biometra TRIO is available in different versions with three blocks for 48 x 0.2 ml tubes, 30 x 0.5 ml tubes, or as combi-block version for 48 x 0.2 ml, or 18* x 0.5 ml tubes. Therefore, the Biometra TRIO promises high parallel throughput (up to 144 x 0.2 ml samples) in combination with the flexibility to run simultaneous protocols. The Biometra TRIO is the perfect instrument for laboratories requiring high flexibility and needing to frequently optimize new PCR protocols.

Temperature Optimization Step (TOS)

This function allows a fast optimization of unknown annealing temperatures for new primer pairs. TOS makes use of the three sample blocks and provides three different temperatures for one selected program step. The user enters a temperature value for block 2 and sets a temperature increment for blocks 1 and 3. For maximum ease of use, the TOS program automatically starts on all three blocks simultaneously.

Advanced comfort

The Biometra TRIO design includes outstanding features – from strong data reliability, to ingenious temperature block control, to advanced user comfort and Whisper Quiet operation.

Your Benefits

- Ultimate flexibility with three independent sample blocks
- Fast ramping rates up to 5 °C/s
- Easy determination of optimal annealing temperatures via TOS function
- Protocol Wizard, including annealing temperature calculator
- Advanced User Management for individual rights settings for each user

* capacity increases to 35 x 0.5 ml tubes by use of small cap tubes.


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Biometra TRIO
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The Biometra Thermal Cycler Family at a Glance

The Biometra thermal cycler family comes with a wide variety of special features that make laboratory work considerably easier and provide excellent results. The following overview allows users to select the device that best suits their specific laboratory requirements.

Unique feature	Biometra TOne	Biometra TAdvanced	Biometra TRIO
Fast Ramping, High Accuracy, Block/ Well Control	✓	✓✓	✓
Whisper Quiet technology	✓	✓	✓
High-Performance Smart Lid	✓	✓	✓
Quick Block Exchange		✓	
Linear Gradient Tool	✓	✓	
Approximate linear temperature increment	In rows 4 to 8	In rows 3 to 10	
Temperature Optimization Step			✓
Protocol Wizard		✓	✓
Advanced User Management		✓	✓
Software language: English, German, Chinese	✓	✓	✓
Three block system			✓
Twin block model		✓	
PCR Control App	✓	✓	✓


Biometra TRIO
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Technical Data

Model	Biometra TOne 96/96 G	Biometra TAdvanced 96/96 G	Biometra TAdvanced 96 S/96 SG	Biometra TAdvanced 60/60 G	Biometra TAdvanced 384/384 G
Block	Aluminum, special alloy	Aluminum, special alloy	Silver, gold-coated	Aluminum, special alloy	Aluminum, special alloy
Capacity	96 x 0.2 ml tubes/ 96-well microtiter plate/12 x 8-well strips, 0.2 ml	96 x 0.2 ml tubes/ 96-well microtiter plate/12 x 8-well strips, 0.2 ml	96 x 0.2 ml tubes/ 96-well microtiter plate/12 x 8-well strips, 0.2 ml	60 x 0.5 ml tubes	384-well microplate
Max. heating rate[1]	4.0 °C/s	6.0 °C/s	8.0 °C/s	6.0 °C/s	4.0 °C/s
Max./min. gradient[2]	20 °C/0.1 °C	30 °C/0.1 °C	40 °C/0.1 °C	30 °C/0.1 °C	24 °C/0.1 °C
Gradient temperature range[2]	20 °C to 99 °C	20 °C to 99 °C	4 °C to 99 °C	20 °C to 99 °C	20 °C to 99 °C
Temperature uniformity at 55 °C after 15 s	± 0.20 °C	± 0.20 °C	± 0.15 °C	± 0.20 °C	± 0.15 °C
Temperature range	3 °C to 99 °C	3 °C to 99 °C	3 °C to 99 °C	3 °C to 99 °C	3 °C to 99 °C
Control accuracy	± 0.1 °C	± 0.1 °C	± 0.1 °C	± 0.1 °C	± 0.1 °C
Lid temperature range	30 °C to 110 °C	30 °C to 110 °C	30 °C to 110 °C	30 °C to 110 °C	30 °C to 110 °C
Program memory	350 programs in up to 90 user directories	350 programs in up to 90 user directories	350 programs in up to 90 user directories	350 programs in up to 90 user directories	350 programs in up to 90 user directories
Dimensions (W x D x H, mm)	260 x 430 x 241	277 x 457 x 264	277 x 457 x 264	277 x 457 x 264	277 x 457 x 264

G = with gradient function
[1] measured within sample block
[2] applies only to cycler models with gradient function
[3] Gradient feature included in one block of the twin-block module
For more technical details please refer to the corresponding Technical Data sheets.

Biometra TAdvanced Twin 48/48 G[3]	Biometra TAdvanced Twin 30	Biometra TAdvanced Twin Combi	Biometra TRIO 48	Biometra TRIO 30	Biometra TRIO Combi
Aluminum, special alloy	Aluminum, special alloy	Aluminum, special alloy	Aluminum, special alloy	Aluminum, special alloy	Aluminum, special alloy
2 x 48 x 0.2 ml tubes/ 2 x 48- well microtiter plate /2 x 6 x 8-well strips, 0.2 ml	2 x 30 x 0.5 ml tubes	2 x 48 x 0.2 ml tubes/ 2 x 6 x 8-well strips, 0.2 ml/2 x 48-well microtiter plate/ 2 x 18* x 0.5 ml tubes	3 x 48 x 0.2 ml tubes/3 x 48- well microtiter plate/ 3 x 6 x 8-well strips, 0.2 ml	3 x 30 x 0.5 ml tubes	3 x 48 x 0.2 ml tubes/3 x 6 x 8-well strips, 0.2 ml/ 3 x 48-well microtiter plate/3 x 18* x 0.5 ml tubes
5.2 °C/s	4.2 °C/s	3.1 °C/s	5.0 °C/s	4.0 °C/s	3.0 °C/s
20 °C/0.1 °C[3]	-	-	-	-	-
20 °C to 99 °C[3]	-	-	-	-	-
± 0.20 °C	± 0.20 °C	± 0.15 °C	± 0.20 °C	± 0.20 °C	± 0.20 °C
3 °C to 99 °C	3 °C to 99 °C	3 °C to 99 °C	3 °C to 99 °C	3 °C to 99 °C	3 °C to 99 °C
± 0.1 °C	± 0.1 °C	± 0.1 °C	± 0.1 °C	± 0.1 °C	± 0.1 °C
30 °C to 110 °C	30 °C to 110 °C	30 °C to 110 °C	30 °C to 110 °C	30 °C to 110 °C	30 °C to 110 °C
350 programs in up to 90 user directories	350 programs in up to 90 user directories	350 programs in up to 90 user directories	350 programs in up to 90 user directories	350 programs in up to 90 user directories	350 programs in up to 90 user directories
277 x 457 x 264	277 x 457 x 264	277 x 457 x 264	300 x 410 x 250	300 x 410 x 250	300 x 410 x 250

* The capacity increases to 35 x 0.5 ml tubes when using tubes with small caps.

Order Information

Biometra TOne Thermal Cycler

Order number	Description
846-x-070-311	Biometra TOne 96 with 96-well sample block (0.2 ml)
846-x-070-301	Biometra TOne 96 G with 96-well sample block (0.2 ml) and gradient function

x = 2 for 230 V, 4 for 115 V, 5 for 100 V, 50 - 60 Hz

Biometra TAdvanced Thermal Cycler

Order number	Description
846-x-070-211	Biometra TAdvanced 96 with 96-well block (0.2 ml)
846-x-070-201	Biometra TAdvanced 96 G with 96-well block (0.2 ml) and gradient function
846-x-070-251	Biometra TAdvanced 96 S with 96-well block (silver, 0.2 ml)
846-x-070-241	Biometra TAdvanced 96 SG with 96-well block (silver, 0.2 ml) and gradient function
846-x-070-210	Biometra TAdvanced 60 with 60-well block (0.5 ml)
846-x-070-200	Biometra TAdvanced 60 G with 60-well block (0.5 ml) and gradient function
846-x-070-224	Biometra TAdvanced 384 with 384-well block
846-x-070-214	Biometra TAdvanced 384 G with 384-well block and gradient function
846-x-070-212	Biometra TAdvanced Twin 48 with 2 x 48-well block (0.2 ml)
846-x-070-202	Biometra TAdvanced Twin 48 G with 2 x 48-well block (0.2 ml) and gradient function in one block
846-x-070-213	Biometra TAdvanced Twin 30 with 2 x 30-well block (0.5 ml)
846-x-070-215	Biometra TAdvanced Twin Combi with 2 x 48-well (0.2 ml) and 2 x 18-well (0.5 ml) block

x = 2 for 230 V, 4 for 115 V and 5 for 100 V, 50 – 60 Hz

Order Information

Biometra TAdvanced Thermal Cycler - Block modules and base unit

Order number	Description
846-070-231	Block module 96 with 96-well block (0.2 ml)
846-070-221	Block module 96 G with 96-well block (0.2 ml) and gradient function
846-070-271	Block module 96 S with 96-well block (silver, 0.2 ml)
846-070-261	Block module 96 SG with 96-well block (silver, 0.2 ml) and gradient function
846-070-230	Block module 60 with 60-well block (0.5 ml)
846-070-220	Block module 60 G with 60-well block (0.5 ml) and gradient function
846-070-234	Block module 384 with 384-well block
846-070-224	Block module 384 G with 384-well block and gradient function
846-070-232	Twin block module 48 with 2 x 48-well block (0.2 ml)
846-070-222	Twin block module 48 G with 2 x 48-well block (0.2 ml) and gradient function in one block
846-070-233	Twin block module 30 with 2 x 30-well block (0.5 ml)
846-070-235	Twin block module Combi with 2 x 48-well (0.2 ml) and 2 x 18-well (0.5 ml) block
846-x-070-280	Biometra TAdvanced base unit

x = 2 for 230 V, 4 for 115 V and 5 for 100 V, 50 – 60 Hz

Biometra TRIO Thermal Cycler

Order number	Description
846-x-070-723	Biometra TRIO 48 with 3 x 48-well block (0.2 ml)
846-x-070-720	Biometra TRIO 30 with 3 x 30-well block (0.5 ml)
846-x-070-724	Biometra TRIO Combi with 3 x 48-well (0.2 ml) and 3 x 18-well (0.5 ml)

x = 2 for 230 V, 4 for 115 V and 5 for 100 V, 50 – 60 Hz

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Pictures: Analytik Jena AG
Subjects to changes in design and scope of delivery as well as further technical development!

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