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TADVANCED

No compromises in technology

- Ultrafast heating and cooling rates
- Excellent temperature uniformity
- High-quality »Made in Germany«

Biometra

PRODUCT LINE

TADVANCED

No compromises in Technology

The new generation of thermocycler

The first model in a series of new Biometra thermocyclers, TAdvanced stands for superior technology and the premium quality »Made in Germany«.

Features of TAdvanced:

- ULTRAFAST: High-speed sample block with an unbeatable heating rate
- EXCELLENT: Absolute temperature uniformity for maximum reproducibility
- EXACT: Intelligent Linear Gradient programming based on the primer annealing temperature
- SMART: Innovative design with high-quality components »Made in Germany«
- QUIET: Low-noise operation thanks to latest technology
- CONVENIENT: 7″ color touchscreen with intuitive user interface
- FLEXIBLE: Individual assignment of rights for different user groups

Made in Germany
Technology
Quality
Innovation
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Quality you can sense

Analytik Jena: Tradition plus innovation

Analytik Jena can look back on a long tradition of developing high-quality, highly precise analytical systems – a tradition that goes all the way back to the beginnings over 150 years ago with Ernst Abbe and Carl Zeiss.
Over the past 25 years, Analytik Jena has become one of the world's most innovative manufacturers of analytical instrumentation.

The Biometra product line: 25 years of experience and expertise

Established in Göttingen, Germany, in 1985, Biometra is an Analytik Jena AG brand offering high-quality life-science products. Biometra's 25 years of experience developing and manufacturing thermocyclers dates back to the introduction of its TRIO thermocycler in 1989.

The premium quality »Made in Germany«

Developed at the Göttingen site, the TAdvanced thermocycler is based on a powerful new electronics and unites superior performance with innovative design. The latter includes a 7" color touchscreen and a new, intuitive software interface. The speed and temperature uniformity of the TAdvanced are unrivaled to date, yielding precise, reproducible results and an easy-to-use thermocycler with excellent technical specifications. The TAdvanced thermocycler is manufactured with exceptionally high-quality materials to create a robust, long-lasting product that will meet the highest demands.

- New electronics combined with a modern design
- 7" touchscreen for easy operation

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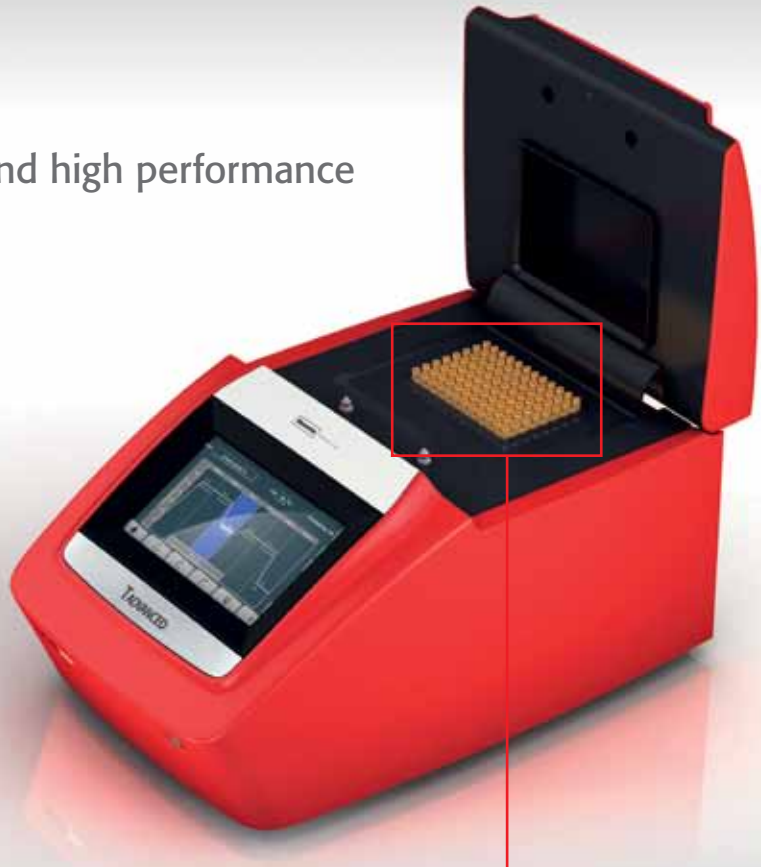
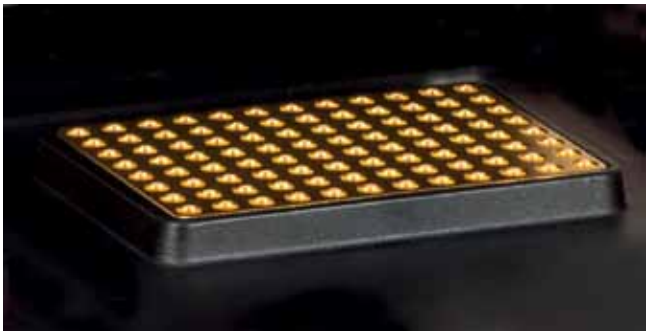
Uniting versatility and high performance



High-speed silver or aluminum block

RAC

The TAdvanced thermocycler is available with either a silver or aluminum sample block. Fastest Ramping: Thanks to the new electronics, the TAdvanced with aluminum block can reach maximum heating and cooling rates of 6°C/s – fastest Ramping rates that so far could only be achieved with a silver block. A high-end version featuring a 96-well silver block is available as well. Highest Accuracy: Because silver conducts heat so well, this block adapts to temperature changes very quickly, maximizing speed and achieving outstanding temperature uniformity. The surface of the valuable silver block is coated with a layer of gold to protect it from corrosion. (picture left side, below) Block Control: The TAdvanced controls the sample block temperature without under- or overshooting the programmed target temperature. This reflects our philosophy that the instrument does exactly what the user has programmed it to do.
The ingenious temperature control system incorporated into our RAC (Ramping – Accuracy – Control) technology maximizes experimental reproducibility.



The perfect block seal

The sample block is also 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 protects the Peltier elements and extends the life of the instrument.

- Outstanding heating and cooling rates for fast protocol run times
- Superior temperature uniformity for reproducible results
- Perfect protection from corrosion and condensation

TADVANCED

Designed down to the smallest detail

Whisper Quiet

The airflow of the TAdvanced thermocycler has been optimized to keep the maximum noise level of the instrument down to an extremely low 45 decibels. This efficient airflow system also means that the TAdvanced takes up very little space.

At 28 x 46 centimeters, the dimensions of the unit would appear to be average at first glance – its effective footprint, however, also has to include the clearance zone needed to accommodate sufficient airflow at the back of the instrument. The efficient airflow of the TAdvanced keeps this additional space requirement down to just ten centimeters – much lower than that of other thermocyclers.

A combination of low noise and a minimal footprint, Whisper Quiet technology is the result of 25 years of thermocycler development experience.

- Smaller effective footprint
- Efficient airflow
- Whisper Quiet technology for quiet operation

High-Performance Smart Lid (HPSL)

The heated lid of the TAdvanced is equipped with HPSL technology. An integrated slip clutch always maintains constant contact pressure, regardless of the 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.

As soon as the heated lid is closed, a rubber seal on 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.

- Optimum contact pressure regardless of the PCR tubes used
- High sample block temperature uniformity
- Reproducible conditions

Automatic lid-opening mechanism

The TAdvanced comes with a one-touch opening mechanism – just press the locking mechanism, and the heated lid automatically swings open. 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.

- Heated lid opens at the press of a button
- The lid's 90° opening angle provides ready access to the sample block
- No risk to the user of burns or bruises

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Intelligent Linear Gradient Tool (LGT)

The intelligent way to program a gradient

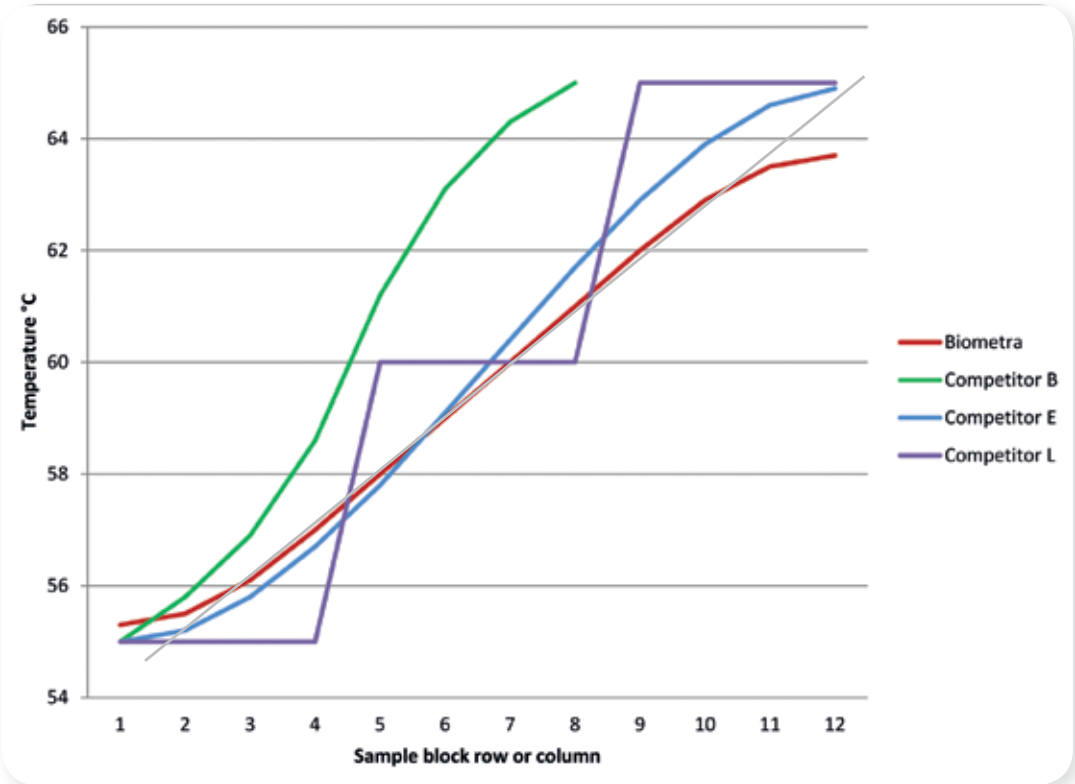
Determining the optimum annealing temperature is a challenge when creating a new primer pair.
One key factor other than the sequence is the melting point (T_m), which indicates the temperature at which 50 % of a double DNA strand dissociates into its single strands. The melting point, in other words, reflects the stability of a primer DNA duplex sequence. A general rule of thumb when designing primers is that the primer should anneal to the template DNA at a temperature between 55 °C and 65 °C. For the first approximation, researchers generally use an annealing temperature (T_a) roughly 5 °C below the calculated melting point of the primer pair.
In practice, however, the calculated Tm value may vary from the optimum annealing temperature by more or less than 5 °C. Using the gradient tool allows the operator to find the optimum annealing temperature under experimental conditions and apply that temperature value to routine applications. Programming gradients usually means having to program two temperature values, one for the first row and one for the last row in the sample block; these two temperatures are then used to determine the gradient range (e.g., 55 °C to 65 °C). For most thermocyclers, either the temperature interval is not the same from one row of the sample block to the next, or the number of rows the gradient can be applied to is lower.

In addition, the sigmoidal temperature curve of the gradient brings two disadvantages:
1. The automatically resulting temperatures for the other rows of the sample blocks, in particular in its center, are almost always odd-numbered.
2. The temperature differences between the rows are unevenly distributed, increasing towards the center of the sample block.

With the LGT, these disadvantages do not occur. The Linear Gradient Tool enables programming of a temperature gradient with defined temperature intervals (increment) between the individual rows of the sample block. It allows the user to enter the calculated T_m value minus, e.g., 5 °C and the desired temperature increment (e.g. ± 1 °C) between the rows of the sample block.
For maximum comfort, the Linear Gradient Tool now supports programming of even-numbered temperature values for a maximum number of rows.

- Entry of the primer annealing temperature
- The temperature interval (increment) between individual rows is definable
- Easy programming of even-numbered temperature values

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. For the Biometra thermocycler (red line), the temperature difference between rows three and ten are exactly the same. Like Biometra, competitor E also applies the gradient along the long side of the sample block. In this case, however, the temperature difference between the rows varies, producing a sigmoidal temperature curve. The temperature differences between rows vary for competitor B as well. Additionally the gradient is applied along the short side of the sample block, resulting in fewer temperature intervals within the block. Although competitor L keeps the temperature constant within a given zone, the number of different temperatures used is considerably smaller.



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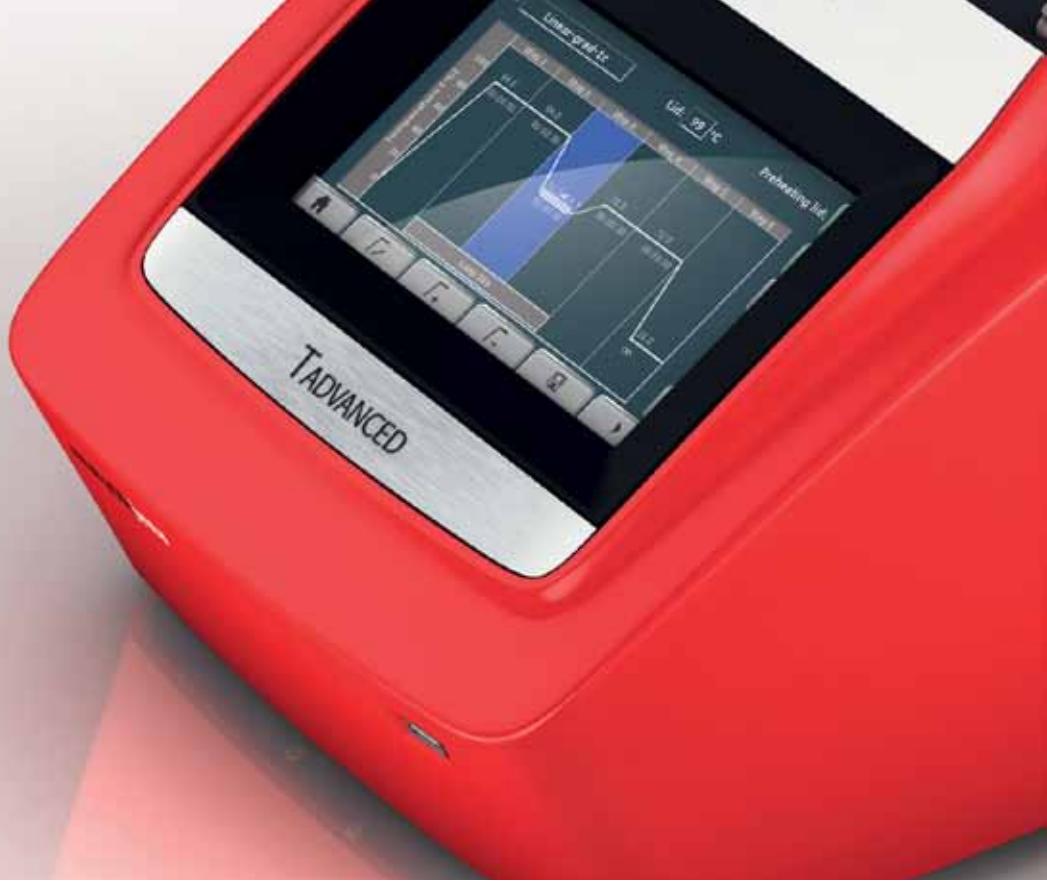
New dimensions



User-specific quick-start list

The TAdvanced thermocycler offers two options for finding programs quickly:

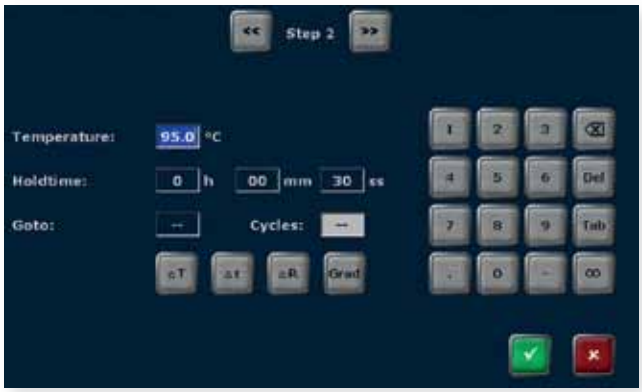
1. Users can check a program in the program preview before starting it.
2. The user-specific quick-start feature lists the five latest started or edited programs by whichever user has logged in.

- The quick-start feature is user specific, showing only the programs for the user in question
- No need to spend a long time searching for the desired program
- The system retains each user's quick-start list, even if the user has been absent for a long period of time

Multi step programming

The TAdvanced thermocycler provides preinstalled program templates for a variety of applications. To make it easy to edit a template or to create a new program, the software also comes with a multi step programming feature that allows users to enter all of the parameters for every program step within a single screen.

- Quickly program new programs or edit program templates
- Switch easily between program steps
- No more constantly switching back and forth between different screens



Extended self-test

The extended self-test covers all of the relevant functions of the thermocycler and summarizes the results in a report.

- Seven different testing fields (six for instruments with no gradient feature)
- Results are stored on the instrument and can be called up individually for each testing field
- No additional costs from required extras such as a USB dongle

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The name says it all

Advanced User Management (AUM)

TAdvanced software can manage up to 30 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 TAdvanced also documents PCR runs by saving error messages and results from the initial and extended self-test.

The documentation tools in combination with AUM allow GLP-compliant operation of the TAdvanced thermocycler.

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

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Brilliant simplicity

Easy spreadsheet programming

The TAdvanced software offers a graphical or tabular program view.
Users can toggle between views to select their preferred mode simply by pressing a button.

- All parameters at a glance
- Table view equals the PCR program record in the laboratory notebook
- Users can toggle between modes quickly

TADVANCED 96/96 G and TADVANCED 96 S/96 SG

Technical data

Name	TAdvanced 96/TAdvanced 96 G (Gradient)		TAdvanced 96 S/TAdvanced 96 SG (Gradient)	
Capacity	96 x 0.2 mL tubes 96-well microtiter plates 12 x 8 well strips, 0.2 mL			
Block material	Aluminum		Silver	
Block coating	Special alloy		Gold	
Max. heating rate*	6.0 °C/sec.		8.0 °C/sec.	
Avg. heating rate*	5.5 °C/sec.		7.0 °C/sec.	
Max./min. gradient	-	30 °C/0.1 °C	-	40 °C/0.1 °C
Gradient temperature range[1]	-	20 °C to 99 °C	-	3 °C to 99 °C
Temperature uniformity	55 °C	± 0,20 °C after 15 sec.	55 °C	± 0,15 °C after 15 sec.
Temperature range	3 °C to 99 °C			
Control accuracy	± 0.1 °C			
Heated lid temperature range	30 °C to 110 °C			
Software	User-specific quick start option for the five most recent programs; program preview before start; option for toggling between table and graph programming mode; linear gradient tool; service info file (SINF) generation; expanded self-test; adjustable heating and cooling rates; gradient temperature diagram view; Ethernet-based PC control; comprehensive user administration tool			
Program memory	Total capacity: 350 programs in up to 30 user directories			
Display	7“ color touchscreen			
Automatic restart after power failure	Yes			
High-Performance Smart Lid (HPSL) technology	Yes			
Power consumption	850 Watts			
Operating voltage	100 V, 115 V, 230 V, 50–60 Hz			
Noise emission	Very low			
Interfaces	USB A, Ethernet			
Ambient conditions	15 °C to 35 °C, 70 % humidity			
Dimensions (W x H x D)	277 mm x 264 mm x 457 mm			
Weight	15 kg			

Order information				
Order number	TAdvanced 96 846-X-070-111	TAdvanced 96 G 846-X-070-101	TAdvanced 96 S 846-X-070-151	TAdvanced 96 SG 846-X-070-141

* measured within sample block
[1] Applies only to TAdvanced 96 G and TAdvanced 96 SG with gradient function
X = 2 for 230 V, 4 for 115 V, 5 for 110 V

Biometra 25 YEARS Thermocycler

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