



# Bio-Rad Thermal Cyclers





# Bio-Rad Thermal Cyclers

Bio-Rad offers a wide range of thermal cyclers with proven performance and an unmatched combination of features. We have a cycler just right for every laboratory, whether you run only a few samples per week or perform high-throughput processes. If you have changing needs, choosing one of our modular platforms makes it simple and economical to add additional features, such as dual-block capacity, gradient optimization, and even real-time PCR, to your thermal cyclers.





# Overview

Thermal cyclers are essential laboratory equipment for researchers who run PCR for sequencing, cloning, genotyping, mutagenesis, and many other applications. Features common to all Bio-Rad thermal cyclers include **Peltier effect technology**, which allows precise temperature control, and 8 or 16 temperature point

**gradient capability** for optimizing PCR assays easily in a single run. Instruments range from an economical option to the flexible 1000-series, which offers multiple block formats for increased throughput capabilities and a dual 48/48-well unit that allows two independent experiments to run simultaneously.

## Thermal Cycler Selection Guide



	<b>T100™ Thermal Cycler</b>	<b>S1000™ Thermal Cycler</b>	<b>C1000 Touch™ Thermal Cycler</b>
<b>Features</b>	<ul style="list-style-type: none"> <li>Robust and economical for routine PCR</li> </ul>	<ul style="list-style-type: none"> <li>High performance with a keypad interface</li> <li>Can also be run connected to a C1000 Touch Thermal Cycler</li> </ul>	<ul style="list-style-type: none"> <li>The best performance with the most flexibility</li> <li>For demanding applications and multiple users</li> </ul>
<b>System tour</b>	 <p>Launch tour <b>T100 Thermal Cycler</b> <a href="http://bio-rad.com/web/T100TourVideo">bio-rad.com/web/T100TourVideo</a></p>	 <p>Launch tour <b>1000-Series Touch Thermal Cyclers</b> <a href="http://bio-rad.com/web/C1000TourVideo">bio-rad.com/web/C1000TourVideo</a></p>	
<b>Block formats</b>	96-well (0.2 ml high-profile)	<ul style="list-style-type: none"> <li>Independent blocks: dual 48/48-well (0.2 ml)</li> <li>Faster ramping: 96-well (0.2 ml)</li> <li>Higher volume: 96-deep well (0.2 and 0.5 ml)</li> <li>High throughput: 384-well</li> </ul>	
<b>Real-time PCR compatibility</b>	N/A	N/A	Upgrades to a CFX96 Touch™, CFX96 Touch Deep Well, or CFX384 Touch™ Real-Time PCR Detection System
<b>User interface</b>	5.7 in. graphical touch screen	LCD panel and keypad	8.5 in. graphical touch screen
<b>PCR consumables</b>	Only high-profile tubes and plates	Both high- and low-profile tubes and plates	
<b>Performance</b>	<ul style="list-style-type: none"> <li>Accuracy: ±0.5°C</li> <li>Uniformity: ±0.5°C well-to-well within 30 sec</li> <li>Maximum ramp rate: 4°C/sec</li> <li>Temperature range: 4–100°C</li> </ul>	<ul style="list-style-type: none"> <li>Accuracy: ±0.2°C</li> <li>Uniformity: ±0.4°C well-to-well within 10 sec</li> <li>Maximum ramp rate: up to 5°C/sec*</li> <li>Temperature range: 0–100°C</li> </ul>	
<b>Thermal gradient span</b>	1–25°C	1–24°C	
<b>Size (W x D x H)</b>	26 x 47 x 23 cm (10 x 18 x 9 in.)	33 x 46 x 20 cm (13 x 18 x 8 in.)	
<b>Weight</b>	9 kg (20 lb)	10 kg (23 lb)	
<b>Connectivity</b>	N/A	Connect up to three S1000 Thermal Cyclers to every C1000 Touch Thermal Cycler	
<b>Memory capacity</b>	Up to 500 protocols; unlimited with a USB drive	>1,000 protocols; unlimited with a USB drive	

\* Depending on reaction module. Go to [bio-rad.com/web/CyclersMore](http://bio-rad.com/web/CyclersMore) for complete specifications.

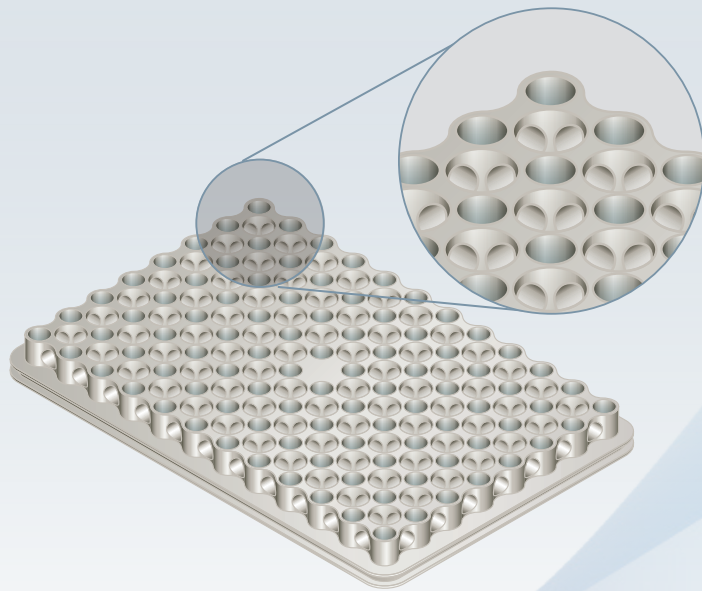
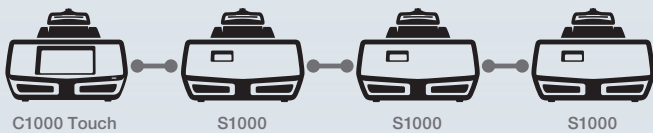




# S1000 Thermal Cycler

## A Great Companion

The S1000 Thermal Cycler is just right for researchers who require the same great thermal performance as the C1000 Touch Cycler. Those who simply need dependable performance can use the S1000 Cycler as a stand-alone instrument for PCR.



The patented\* reduced-mass honeycomb sample block heats and cools more quickly than standard blocks, so average ramp rates are increased and overall run times are reduced.

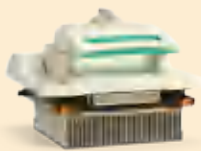
\* U.S. patent 7,632,464.



The S1000 Cycler offers the same thermal performance as the C1000 Touch Cycler and still allows you to:

- Choose your favorite vessels and sealers for use with the fully adjustable heated lid
- Easily optimize your results with a gradient-enabled reaction module that suits your needs: Dual 48/48-Well Fast, 96-Well Fast, 96-Deep Well, or 384-Well Module
- Save time by finishing runs sooner with the patented\* reduced-mass honeycomb sample block; faster ramping and settling produce the shortest time to target temperature
- Increase your throughput by connecting up to 3 S1000 Cyclers to a C1000 Touch Cycler to form a high-throughput multi-bay instrument

## S1000 Reaction Modules for PCR



### 96-Well Fast Reaction Module, Gradient Enabled

- Holds 96 x 0.2 ml tubes or one 96-well plate

### 96-Deep Well Reaction Module, Gradient Enabled

- Holds 96 x 0.2 ml tubes, 48 x 0.5 ml tubes, or one 96-well plate

### 384-Well Reaction Module, Gradient Enabled

- Holds one 384-well plate



### Dual 48/48-Well Fast Reaction Module, Gradient Enabled

- Holds 2 x 48 x 0.2 ml tubes or two 48-well plates

# C1000 Touch Thermal Cycler

## A Premium Instrument for PCR

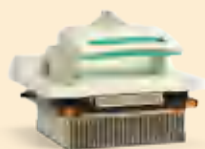
The C1000 Touch Cycler is the flagship instrument of the 1000-series thermal cycling platform, offering unmatched performance for fast, reliable results and a state-of-the-art interface with new ways to optimize protocols and monitor runs. The C1000 Touch Cycler offers all the powerful features of the 1000-series platform.

- Save time by easily creating and viewing protocols using the large color touch screen display and intuitive graphical programming
- Store your data and manage and transfer files using a USB flash drive
- Save costs by upgrading to real-time PCR using the CFX96™, CFX96 Deep Well, or CFX384™ Optical Reaction Module
- Quickly optimize reactions for speed using the unique protocol autowriter
- Protect files with optional log-in, restricted user privileges, and secure mode for controlled environments
- Meet your laboratory's compliance requirements with our IQ/OQ and thermal validation services



**Quick and easy protocol programming.** The protocol autowriter in the cycler's onboard software can automatically suggest a fast temperature protocol based on input parameters. Suggested protocol is based on standard PCR guidelines, with hot-start, initial denaturation, annealing, and extension steps. Further reductions of run times are achieved by minimizing the number of steps and cycles, incubation times, and temperature differentials.

## C1000 Touch Reaction Modules for PCR



### 96-Well Fast Reaction Module, Gradient Enabled

- Holds 96 x 0.2 ml tubes or one 96-well plate

### 96-Deep Well Reaction Module, Gradient Enabled

- Holds 96 x 0.2 ml tubes, 48 x 0.5 ml tubes, or one 96-well plate
- Perfect for Droplet Digital™ PCR applications

### 384-Well Reaction Module, Gradient Enabled

- Holds one 384-well plate



### Dual 48/48-Well Fast Reaction Module, Gradient Enabled

- Holds 2 x 48 x 0.2 ml tubes or two 48-well plates

## Upgrade to Real-Time PCR with CFX96, CFX96 Deep Well, or CFX384 Optical Reaction Module



### 96-Well Fast Optical Reaction Module, Gradient Enabled

- Holds 96 x 0.2 ml tubes or one 96-well plate

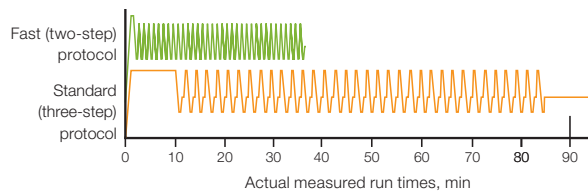
### 96-Deep Well Optical Reaction Module, Gradient Enabled

- Holds 96 x 0.2 ml tubes, 48 x 0.5 ml tubes, or one 96-well plate

### 384-Well Optical Reaction Module, Gradient Enabled

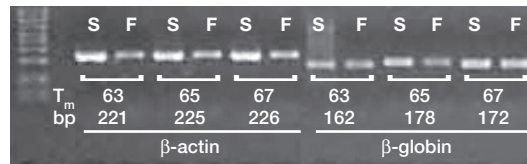
- Holds one 384-well plate

## Step Up to Fast PCR with Bio-Rad's Thermal Cyclers and Reagents

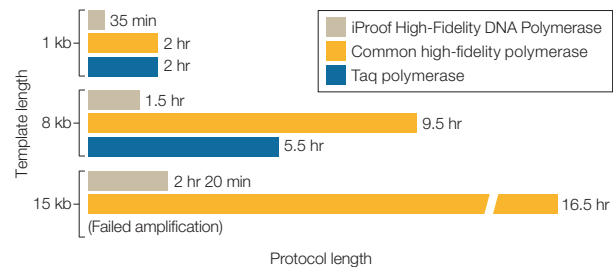


PCR run times can be dramatically reduced without giving up the flexibility, modularity, and gradient capability of Bio-Rad thermal cyclers. With our cyclers, enzymes, and reaction vessels you can:

- Shorten PCR runs from 1.5 hr to 35 min
- Reliably amplify long (1 kb), longer (8 kb), and extra-long (15 kb) targets 3–4 times faster than with standard protocols
- Obtain SYBR® Green real-time PCR data in <40 min with any Bio-Rad real-time PCR system



**Fast two-step protocol results are comparable to those generated using standard protocols.** β-actin and β-globin targets were amplified from human genomic DNA using iTaQ™ DNA Polymerase. Standard (S) protocol, 1.5 hr; fast (F) protocol, 35 min.

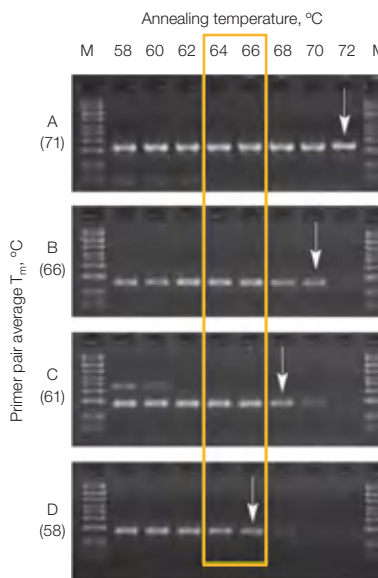


**For long (1–15 kb) targets, use of iProof™ High-Fidelity DNA Polymerase reduces run times three- to fourfold.** Targets of 1, 8, or 15 kb were amplified using three different polymerases. A two-step PCR protocol was used with iProof Polymerase; three-step protocols using the shortest recommended extension times were used with other polymerases. Because iProof Polymerase requires an annealing temperature 5–8°C above typical annealing temperatures, two-step protocols often can be run without redesigning primers.

## Thermal Gradient

### Optimize Reactions in a Single Run

- Optimizing annealing temperatures improves speed and specificity of PCR and real-time PCR
- Multi-zone temperature control ensures accuracy and reproducibility for dependable results
- Dynamic ramping keeps incubation times constant
- Thermal gradient feature is available on all of Bio-Rad's thermal cyclers and real-time PCR systems



**Gradient optimization of different PCR reactions.** All reactions were evaluated in a single run. Four different primer sets (A, B, C, and D) were designed and tested for amplification. Arrows indicate the annealing temperature that provided the highest specificity while maintaining good yield. Yellow box indicates optimal temperatures. M, markers; T<sub>m</sub>, melting temperature.



## PCR Consumables

Bio-Rad's broad selection of reaction vessels, including 0.5 ml and 0.2 ml tubes, high-profile and low-profile microplates, and high-density 384-well plates, allows you to choose the best vessel for your application. A full selection of reliable sealers is available for each vessel and can be selected based on vessel type, cycling application, or storage method. We also offer specialized sealers for real-time PCR. Use the table below to find the best vessels and sealers to use in your Bio-Rad thermal cycler.

Go to [bio-rad.com/web/CyclerConsumables](http://bio-rad.com/web/CyclerConsumables) for more information about any of these products.



## Thermal Cycler Compatibility with PCR Plastic Consumables

Catalog #	Tubes			384-Well Plates	
	Individual High-Profile	Strips High-Profile	Strips Low-Profile	Hard-Shell® Standard	Hard-Shell 480
	TBI-0201, TFI-0201, TWI-0201	TBS-xxxx, TBC-xxxx	TLS-xxxx	HSP-3xxx	HSR-48xx
Bio-Rad® C1000™, C1000 Touch, S1000	✓	▲	✓	✓	▲
Bio-Rad T100	✓	✓			
Bio-Rad® DNA Engine®, DNA Engine Tetrad®, DNA Engine Tetrad 2, DNA Engine Dyad®, Dyad Disciple™, PTC-100®	✓	▲	✓	✓	▲
Bio-Rad® iCycler®, MyCycler™	✓	✓			
Bio-Rad® MJ Mini™	✓	▲	✓		

### 96- and 48-Well Plates

Catalog #	Hard-Shell Semi-Skirted High-Profile	Hard-Shell Skirted Low-Profile	Hard-Shell Semi-Skirted Low-Profile	Multiplate™ Unskirted High-Profile	Multiplate Unskirted Low-Profile	iQ™ Semi-Skirted High-Profile
	HSS-9xxx	HSP-9xxx	HSL-9xxx	MLP-xxxx	MLL-xxxx	223-9441
Bio-Rad C1000, C1000 Touch, S1000	▲	✓	▲	▲	▲	▲
Bio-Rad T100	✓			▲		▲
Bio-Rad DNA Engine, DNA Engine Tetrad, DNA Engine Tetrad 2, DNA Engine Dyad, Dyad Disciple, PTC-100	▲	✓		▲	▲	▲
Bio-Rad iCycler, MyCycler	✓ Except MyCycler			✓		▲
Bio-Rad MJ Mini				▲	✓	

### Cap Strips and PCR Plate Seals

Catalog #	Microseal® 'A' Film	Microseal 'B' Adhesive Seals	Domed 8-Cap Strips	Optical Flat 8-Cap Strips
	MSA-5001	MSB-1001	TCS-0801	TCS-0803
Bio-Rad C1000, C1000 Touch, S1000	▲	✓	✓	✓
Bio-Rad T100	▲	✓	✓	✓
Bio-Rad DNA Engine, DNA Engine Tetrad, DNA Engine Tetrad 2, DNA Engine Dyad, Dyad Disciple, PTC-100	▲	✓	✓	✓
Bio-Rad iCycler, MyCycler	▲	✓	✓	✓
Bio-Rad MJ Mini			✓	✓

## PCR Plate Sealer and Heat Seals

Catalog #	Heat Seals			
	Optically Clear Heat Seal	Permanent Clear Heat Seal	Pierceable Foil Heat Seal	Peelable Foil Heat Seal
	181-4030	181-4035	181-4040	181-4045
PX1™ PCR Plate Sealer	✓	✓	✓	✓

✓ Recommended ▲ Compatible  
For more information, request bulletin 6090.

## Sample Preparation and PCR Reagents

For a simple and reliable way to extract and purify nucleic acids and amplify target sequences with high specificity and efficiency, choose from the tools below.



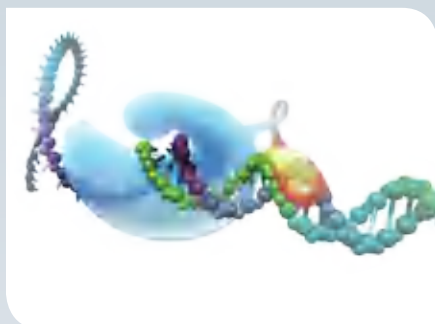
### Nucleic Acid Sample Preparation

Select the right kit to extract and purify RNA, DNA, and PCR products with high yield and purity for various downstream applications.



### Reverse Transcription

Achieve efficient reverse transcription across a broad linear dynamic range with flexible input RNA capacity.



### High-Fidelity and Standard PCR Reagents

Control and create your own PCR master mix using Bio-Rad's advanced hot-start or high-fidelity enzymes, dNTPs, and buffers. Or, simply select a suitable premade master mix.



### Real-Time Quantitative PCR Reagents

Ready-to-use 2x supermixes are optimized for quantitative PCR (qPCR) and are tested for efficient and specific amplification over a wide dynamic range of input template.



## Ordering Information

Catalog # Description

### T100 Thermal Cycler

186-1096 **T100 Thermal Cycler**, includes 96-well thermal cycler, power cord, Tube Support Ring

### S1000 Thermal Cycler

184-2000 **S1000 Thermal Cycler Chassis**, includes power cord; does not include reaction module

185-2148 **S1000 Thermal Cycler with Dual 48/48 Fast Reaction Module**, includes S1000 Thermal Cycler Chassis, Dual 48/48-Well Fast Reaction Module

185-2196 **S1000 Thermal Cycler with 96-Well Fast Reaction Module**, includes S1000 Thermal Cycler Chassis, 96-Well Fast Reaction Module

185-2197 **S1000 Thermal Cycler with 96-Deep Well Reaction Module**, includes S1000 Thermal Cycler Chassis, 96-Deep Well Reaction Module

185-2138 **S1000 Thermal Cycler with 384-Well Reaction Module**, includes S1000 Thermal Cycler Chassis, 384-Well Reaction Module

### C1000 Touch Thermal Cycler

184-1100 **C1000 Touch Thermal Cycler Chassis**, includes USB flash drive, power cord; does not include reaction module

185-1148 **C1000 Touch Thermal Cycler with Dual 48/48 Fast Reaction Module**, includes C1000 Touch Thermal Cycler Chassis, Dual 48/48-Well Fast Reaction Module, USB flash drive

185-1196 **C1000 Touch Thermal Cycler with 96-Well Fast Reaction Module**, includes C1000 Touch Thermal Cycler Chassis, 96-Well Fast Reaction Module, USB flash drive

185-1197 **C1000 Touch Thermal Cycler with 96-Deep Well Reaction Module**, includes C1000 Touch Thermal Cycler Chassis, 96-Deep Well Reaction Module, USB flash drive

185-1138 **C1000 Touch Thermal Cycler with 384-Well Reaction Module**, includes C1000 Touch Thermal Cycler Chassis, 384-Well Reaction Module, USB flash drive

### 1000-Series Reaction Modules

184-0148 **Dual 48/48-Well Fast Reaction Module**, independent Dual 48/48-Well Fast Reaction Module, fits C1000, C1000 Touch, and S1000 Thermal Cyclers, gradient enabled

184-0196 **96-Well Fast Reaction Module**, fits C1000, C1000 Touch, and S1000 Thermal Cyclers, gradient enabled

184-0197 **96-Deep Well Reaction Module**, fits C1000, C1000 Touch, and S1000 Thermal Cyclers, gradient enabled

184-0138 **384-Well Reaction Module**, fits C1000, C1000 Touch, and S1000 Thermal Cyclers, gradient enabled

184-5097 **CFX96 Optical Reaction Module**, for use with C1000 Touch Thermal Cycler Chassis, includes CFX Manager™ Software, license for qbase+ Software, communication cable

184-4095 **CFX96 Deep Well Optical Reaction Module**, for use with C1000 Touch Thermal Cycler Chassis, includes CFX Manager Software, license for qbase+ Software, communication cable

184-5384 **CFX384 Optical Reaction Module**, for use with C1000 Touch Thermal Cycler Chassis, includes CFX Manager Software, license for qbase+ Software, communication cable, reagents, consumables

SYBR is a trademark of Life Technologies Corporation.

Bio-Rad's thermal cyclers and real-time thermal cyclers are covered by one or more of the following U.S. patents or their foreign counterparts owned by Eppendorf AG: U.S. Patent Numbers 6,767,512 and 7,074,367.

The purchase of iProof and iTaq Polymerases includes an immunity from suit under patents specified in the product insert to use only the amount purchased for the purchaser's own internal research. No other patent rights are conveyed expressly, by implication, or by estoppel. Further information on purchasing licenses may be obtained by contacting the Director of Licensing, Applied Biosystems, 850 Lincoln Centre Drive, Foster City, California 94404, USA.

Hard-Shell Plates are covered by one or more of the following U.S. patents or their foreign counterparts owned by Eppendorf AG: U.S. Patent Numbers 7,347,977; 6,340,589; and 6,528,302.