

PCR and Real-Time PCR:
MJ Mini and MiniOpticon Instruments



MJ Mini™ Thermal Cycler and
MiniOpticon™ Real-Time PCR System



Small on Size Big on Performance

The compact 48-well MJ Mini personal thermal cycler is a powerful small-capacity, high-performance cycler. Unlike other personal thermal cyclers, the MJ Mini cycler offers thermal gradient technology so you can optimize reactions for maximum efficiency and accurate quantitation. The MiniOpticon real-time PCR system, built on the MJ Mini cycler, is one of the smallest real-time detection systems available.

Now, the most advanced PCR techniques are available to the individual researcher — with the MJ Mini thermal cycler and the MiniOpticon real-time PCR system.



Maximize Reaction Efficiency and Increase Accuracy of Quantitation

Selecting the optimal annealing temperature for your oligo reduces amplification of nonspecific products. The MJ Mini cycler's thermal gradient feature makes finding the optimal temperature easy, by allowing you to program a temperature gradient across the sample block for any incubation step. After analysis of PCR products, use the gradient calculator to see which temperature gave the best results. Simply enter the temperature range, and the calculator displays the exact temperature at which each sample was run. With thermal gradient technology, your PCR reactions can be optimized in a single experiment.

MJ Mini Personal Thermal Cycler

The innovative MJ Mini cycler offers outstanding thermal performance. Quick ramping and accurate temperatures ensure fast, reproducible runs; but more importantly, the MJ Mini cycler arrives at thermal uniformity remarkably fast, producing the precision needed for sensitive assays such as quantitative PCR.

The 48-well sample block is capped with an adjustable heated lid that accommodates both full-height and low-profile tubes and plates, so you can run low-volume reactions with minimal sample loss.

The MJ Mini cycler lets you:

- Choose the reaction vessels that best suit your application — 0.2 or 0.5 ml tubes, strip tubes, or 48-well PCR plates
- Save time by optimizing incubation temperatures in a single run using the thermal gradient feature
- Rapidly modify programs using textual and graphical display and editing options

MiniOpticon Real-Time PCR System

The MiniOpticon system is a compact two-color real-time PCR detection platform for the MJ Mini cycler. It's one of the smallest and most portable systems available for real-time PCR applications and gel-free PCR analysis.

The MiniOpticon system uses an optical design in which samples are sequentially illuminated by a fixed array of 48 light-emitting diodes (LEDs), and emitted fluorescence is detected by one of two filtered photodiodes. This no-moving-parts design allows sensitive detection in a small yet robust package.

The MiniOpticon system lets you:

- Use the precise thermal control and temperature gradient of the MJ Mini cycler to perform accurate quantitative PCR
- Amplify up to 2 targets per well using a range of fluorophores
- Perform real-time PCR where you need it — the small size and portability let the system fit just about anywhere
- Get results quickly using built-in analysis tools for quantitative reverse transcription PCR (RT-PCR), relative gene-expression analysis, and allelic discrimination
- Expand throughput when you need to by connecting up to 4 instruments to a single computer

Textual mode

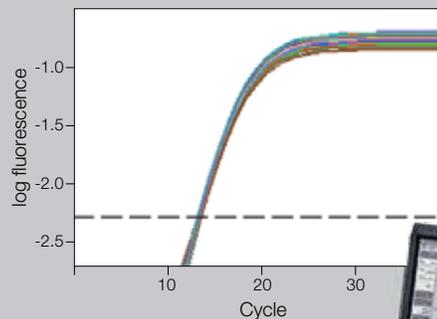
```
Edit: Lid: 100.0°C
BASIC Vol: 20µL
1= 94.0° FOR 0:30
2= 91.2° FOR 0:15
3= 60.0° FOR 1:00
4= 72.0° FOR 1:00
5= GOTO 2, 25 TIME
Press ENTER to edit
```

Toggle key



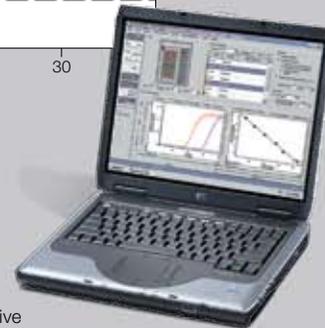
Graphical mode

Two easy programming options on the MJ Mini cycler. A graphical mode allows you to quickly modify basic cycling parameters, while a menu-based text mode allows you to efficiently enter advanced options. During a PCR run, pressing a single key changes the display to show: list of program steps; graphical representation of protocol progress with real-time displays of block, lid, and sample temperatures; and time remaining in run.



Analysis of 48 replicate PCR samples spanning the cycler block reveals a variation less than 1%.

The high degree of uniformity, made possible by combining the innovative optical system of the MiniOpticon real-time PCR system with the high performance of the MJ Mini thermal cycler, ensures reliable and reproducible results from sample to sample and experiment to experiment.



Specifications

MJ Mini Cycler Specifications

Sample capacity	48 x 0.2 ml tubes, 48-well PCR plate, 6 x 8-tube strips, or 12 x 0.5 ml tubes
Speed of ramping	Up to 2.5°C/sec
Thermal range	0–99°C, but no more than 30°C below ambient temperature
Temperature accuracy	±0.2°C of programmed target at 90°C, NIST-traceable
Temperature uniformity	±0.4°C well-to-well within 10 sec of arrival at 90°C
Input range	100–240 VAC, 50–60 Hz, 400 W maximum
Dimensions (W x D x H)	19 x 32 x 20 cm (7.5 x 12.5 x 8")
Weight	4.1 kg (9.1 lb)
Display	64 x 128 LCD
Ports	2 USB
Memory	400 typical programs

MiniOpticon System Specifications

Fuses	Two 6.3 A, 250 V, 5 x 20 mm
Weight	6.8 kg (15 lb)
Dimensions (W x D x H)	18 x 32 x 33 cm (7 x 13 x 13")
Excitation range	470–500 nm
Detection ranges	Channel 1: 523–543 nm Channel 2: 540–700 nm

Gradient Specifications

Gradient accuracy	±0.4°C of programmable target at end rows within 10 sec, NIST-traceable
Row uniformity	±0.4°C well-to-well (within row) within 30 sec of reaching target temperature
Calculator accuracy	±0.4°C of actual row temperature
Gradient range	35–99°C
Temperature differential range	1–16°C

Computer Specifications

Minimum specifications required for running a MiniOpticon system and Opticon Monitor™ software version 3.1	
Operating system	Windows XP Professional
Processor speed	1.5 GHz
Display	1,024 x 768 screen resolution
Memory	512 MB RAM
Storage	20 GB hard drive

Ordering Information

Catalog #	Description
MJ Mini Thermal Cycler and Accessories	
PTC-1148	MJ Mini 48-Well Personal Thermal Cycler , with adjustable heated lid and PCR tubes, holds 48 x 0.2 ml tubes
MLL-4801	Multiplate™ Low-Profile 48-Well Unskirted PCR Plates , 8 x 6 format, natural color, thin-wall polypropylene, package of 50
TLS-0801	Low-Profile 0.2 ml 8-Tube Strips Without Caps , natural, 120 strips (960 tubes)
TCS-0801	Domed 8-Cap Strips , for 0.2 ml tubes and plates, natural, 120
TBI-0502	0.5 ml Tubes With Flat Caps , natural, 800 (8 bags of 100)
MiniOpticon Real-Time System and Accessories	
CFB-3120	MiniOpticon Real-Time PCR System , includes optical housing, MJ Mini thermal cycler, analysis software
MLL-4851	Multiplate Low-Profile 48-Well Unskirted PCR Plates , white, 50
TLS-0851	Low-Profile 0.2 ml 8-Tube Strips Without Caps , white, 120 strips (960 tubes)
TCS-0803	Optical Flat 8-Cap Strips , for 0.2 ml tubes and plates, ultraclear, 120

Purchase of this instrument conveys a limited non-transferable immunity from suit for the purchaser's own internal research and development and for use in applied fields other than Human In Vitro Diagnostics under one or more of U.S. Patents Nos. 5,656,493, 5,333,675, 5,475,610 (claims 1, 44, 158, 160–163 and 167 only), and 6,703,236 (claims 1–7 only), or corresponding claims in their non-U.S. counterparts, owned by Applera Corporation. No right is conveyed expressly, by implication or by estoppel under any other patent claim, such as claims to apparatus, reagents, kits, or methods such as 5' nuclease methods. 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.

Bio-Rad's real-time thermal cyclers are licensed real-time thermal cyclers under Applera's United States Patent No. 6,814,934 B1 for use in research and for all other fields except the fields of human diagnostics and veterinary diagnostics.

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