DNA Engine®

Thermal Cyclers

From the MJ line of amplification products.

BIO-RAD

The MJ Line of Amplification Products

Cyclers That Meet the Needs of Every Researcher

Bio-Rad is proud to offer the MJ line of thermal cyclers, which includes the landmark DNA Engine family. Since 1988, the MJ brand has become practically synonymous with thermal cycling. Having mastered Peltier technology, MJ line cyclers were the first to deliver excellent thermal control in a compact and affordable instrument. In fact, the original Peltier thermal cycler, the PTC-100® cycler, and later the DNA Engine cycler, established the design on which most of today's thermal cyclers are modeled.

The DNA Engine line is our premium value instrument platform, incorporating the most advanced thermal technologies with unparalleled flexibility. The hallmark of the DNA Engine — the Alpha unit — allows you to adjust your cycler's capacity and vessel accommodation as your research needs evolve.

DNA Engine® Thermal Cycler

- **Upgradable to Opticon™ and Chromo4™ real-time systems**

Dyad™/Dyad Disciple Cycler Tandem

- **Choice of two space-saving configurations**

DNA Engine Dyad® Thermal Cycler

- Advanced graphical interface

Alpha™ Units

- Interchangeable sample blocks

Dyad Disciple™ Thermal Cycler

- Directed by an attached Dyad cycler or PC; upgradable to Chromo4 real-time system

DNA Engine Tetrad® 2 Thermal Cycler

- Updated version of the cycler that powered the Human Genome Project

Alpha Units — the Heart of the DNA Engine Thermal Cycler

Alpha units are swappable sample-block/heat-pump assemblies that can be used to customize any DNA Engine line thermal cycler, and over ten Alpha units have been developed to accommodate the diverse needs of modern laboratories. Alpha types vary by number of sample blocks (one or two), sample capacity, and heated lid technology — and the new Chromo4 module performs real-time PCR.

Each Alpha unit contains the thermoelectric heat pumps and sensors that are required to modulate sample temperatures, while the thermal cycler base delivers the electric power and appropriate software control. Our pioneering multi-sensor, multizone temperature control provides superb temperature uniformity across a sample block, producing consistent temperature profiles across samples and between subsequent runs. Each Alpha unit is meticulously temperature-qualified using NIST-traceable standards, ensuring comparable performance from any Alpha unit, regardless of format or thermal cycler chassis used. In fact, frequent changing does not affect thermal performance of Alpha units, and protocols established on one instrument can be readily transferred to other DNA Engine line cyclers.

Interchangeable formats for changing demands

Installing an Alpha unit requires no tools — Alpha units can be rapidly exchanged to quickly accommodate various vessel types and a range of sample capacities.

Standard Alpha Units — Manual Heated Lids

Standard Alpha units feature adjustable heated lids, which are manually set to optimize the sealing pressure for diverse types of vessels and sealers. The amount of pressure is adjusted with the use of a thumbwheel and the lid temperature is set with the thermal cycler software.

Single-Block Alpha Units — 96-well single blocks are gradient capable.

"96V"	ALS-1296	Holds 96 x 0.2 ml tubes, one 96-well plate, or up to 30 x 0.5 ml tubes
"384"	ALS-1238	Holds one 384-well plate
"60V"	ALS-1260	Holds 60 x 0.5 ml tube
"Flat"	ALS-1200	Holds microarrays, biochips, and flat-bottom vessels

Dual-Block Alpha Units — Dual Alpha™ units are independently controllable, so separate protocols may be run side-by-side.

"48/48"	ALD-1244	Holds 2 x 48 x 0.2 ml tubes or up to 2 x 12 x 0.5 ml tubes
"30/48"	ALD-1234	Holds 30 x 0.5 ml and 48 x 0.2 ml tubes
"30/30"	ALD-1233	Holds 2 x 30 x 0.5 ml tubes

Slide Chambers™ Alpha Unit

Slide Chambers Alpha units thermally cycle glass microscope slides in a dual-block format, with each block holding up to 16 slides, and are designed for in situ techniques and humidified chamber hybridizations.

Slide Chambers Dual Block — The two chambers are independently controllable, so separate protocols may be run side-by-side.

"16/16"	ALD-0211	Holds 2 x 16 glass slides
"16/16"	ALD-0212	Holds 2 x 16 glass slides, reverse mounted for Tetrad™ cyclers

Moto Alpha™ Units — Motorized Heated Lids

Moto Alpha units are equipped with motorized heated lids and are designed for automation integrations, low-volume cycling, and high-throughput applications. The sealing pressure and opening angle are set with the software and may be controlled remotely from a PC.

Moto Alpha Units — Moto Alpha units are available in single-block formats only; 96-well single blocks are gradient capable.

"96V"	ALP-2296	Holds 96 x 0.2 ml tubes, one 96-well plate, and up to 30 x 0.5 ml tubes
"384"	ALP-2238	Holds one 384-well plate
"Flat"	ALS-2200	Holds microarrays, biochips, and flat-bottom vessels

Chromo4™ Detector — 4-Color Real-Time Detection

The Chromo4 module is a real-time detector mounted to a 96-well gradient Alpha unit and equipped with a user-changeable photonics shuttle for four-color excitation and detection. The Chromo4 module uses long-lived LEDs for excitation and sensitive photodiodes for detection, ensuring accurate results from start to finish.

Chromo4 Detector — Requires external PC; gradient capable.

"96V"	ALS-3296	Holds 96 x 0.2 ml tubes or one 96-well plate
	CFD-3240	Chromo4 real-time PCR detector; includes optical housing and analysis software
	CDM-324001	Chromo4 photonics shuttle; contains LEDs, photodiodes, and filters

DNA Engine Line Thermal Cyclers

DNA Engine

The popular single-bay DNA Engine cycler, the namesake of the product line, revolutionized thermal cycling when introduced in 1994. The DNA Engine was the first to provide a high level of thermal performance with swappable blocks and an elegant compact design. The DNA Engine can be upgraded to a dedicated real-time Opticon system or be used with the swappable Chromo4 real-time detector.

Dyad

The dual-bay DNA Engine Dyad thermal cycler features a high-density graphical interface and color display. Point-and-click navigation through the software (via onboard touchpad or external mouse) enables rapid input of protocols. For laboratories expecting increased sample throughput, the Dyad can be expanded to a four-bay system with the addition of the Dyad Disciple thermal cycler.

DNA Engine line thermal cyclers include 1-, 2-, and 4-bay cycling systems, with each model delivering equivalent thermal performance. Multi-bay systems allow each Alpha unit to be independently controlled, and with dual-block Alpha units, two different protocols can be run side-by-side in a single bay. For instance, a four-bay Tetrad cycler (when outfitted with four dual-block Alpha units) can run up to eight independent protocols simultaneously.

Dyad Disciple

The Dyad Disciple thermal cycler converts the Dyad instrument to a 4-bay thermal cycler, or may be run independently with a desktop PC. The Dyad Disciple attaches to a Dyad cycler or a PC running Windows OS and outfitted with Disciple Desktop™ freeware. For remote operation in robotic integrations, the Dyad Disciple is an excellent choice due to its small size and economical price. The Dyad Disciple can be upgraded to real-time PCR capability using a Chromo4 detector with the Opticon Monitor™ software run through an attached PC.

Tetrad 2

The Tetrad 2 thermal cycler features the advanced graphical interface found on the Dyad cycler grafted onto the space-saving Tetrad four-bay design. The high-capacity Tetrad served as the thermal cycling backbone for the Human Genome Project. With the advanced programming interface and increased file management tools, the Tetrad 2 is the preferred cycler for high-throughput cycling in both research and production environments.

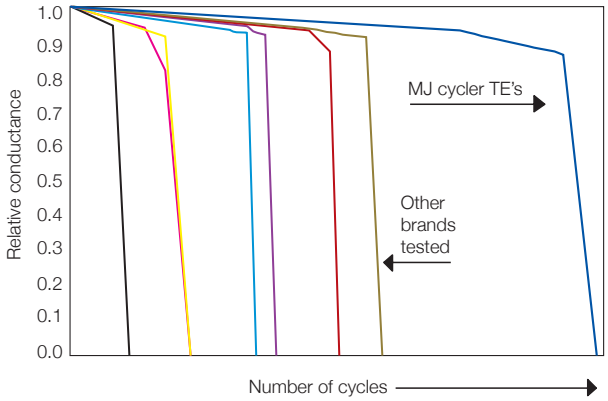
High-Performance Technology for Unparalleled Results

The integrity of MJ line thermal cyclers rests on the performance of the Peltier heat pumps (or thermoelectric modules, TE) that are responsible for delivering rapid and accurate thermal changes to reaction samples. In order to maintain the highest TE production guidelines, our engineers created their own state-of-the-art TE manufacturing facility, which produces solid-state TE modules that withstand the thermal stresses associated with rapidly cycling temperatures and provide years of accurate and reliable thermal performance.

MJ Line Cyclers Deliver the Best in Peltier Technology

Extensive life testing, in which TEs are subjected to repeated temperature cycling until failure, indicates that MJ brand TEs outperform and outlast any other TE on the market. The collected data show that TEs in MJ line cyclers last significantly longer, and decay at a much slower rate, than some of the best TEs built by manufacturers throughout the world.

Comparative Lifetime of Peltier TEs

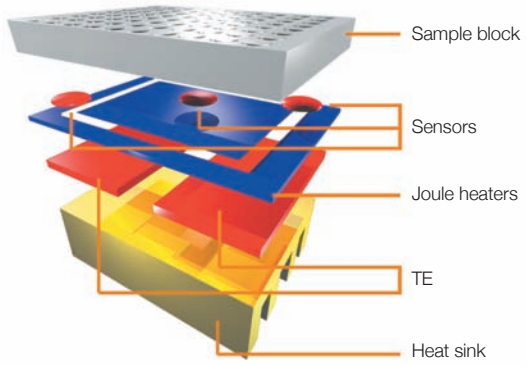


A standard accelerated life test for thermoelectric modules involves repeatedly cycling a sample block of standard mass. The x-axis represents the number of cycles and the y-axis represents relative change in conductance (decreased conductance is a sign of incipient failure). The various "brands" represent competing premium TEs designed or rated for thermal cycling.

Multizone Thermal Control

Multiple zones of thermal control across sample blocks enable the DNA Engine line of cyclers to deliver remarkable well-to-well temperature uniformity (±0.4°C). Precision Joule heaters adjust the temperature of perimeter wells — where thermal losses to radiative heat are the highest — independently of center wells. Sophisticated algorithms use readings from three sensors in a single-block Alpha unit to adjust four independently controlled thermal zones (left, right, inner, and outer), quickly bringing the sample block to uniformity even when samples are asymmetrically loaded. Multizone control consistently delivers thermal uniformity.

Block Assembly Diagram of an Alpha Unit



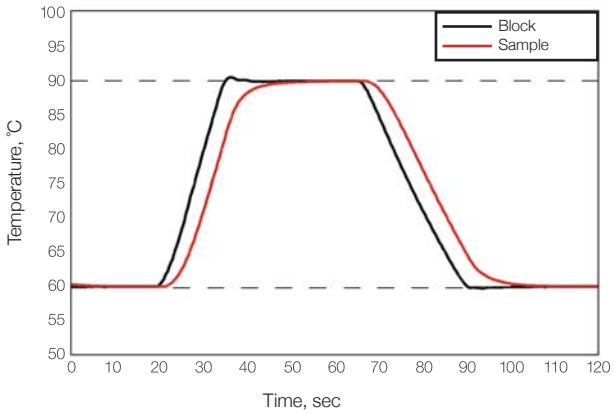
Precision Joule heaters adjust perimeter wells where thermal losses to radiative heat are the highest. Multiple sensors and independently controlled TEs compensate for asymmetrically loaded samples.

"Block" vs. "Calculated" Temperature Control

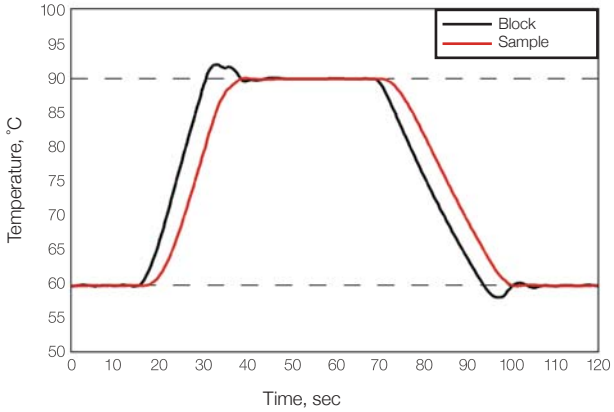
The DNA Engine line of thermal cyclers offers two modes of controlling sample temperatures. With the simplest method, block temperature control mode, the instrument monitors the temperature of the block and precisely heats and cools as directed. However, when the temperature within a sample is measured, an almost asymptotic lag can be noticed as heat is transferred from block to vessel to sample (upper panel, opposite).

As an alternative, DNA Engine line cyclers also offer a calculated temperature control mode. With this option, the software asks the user to input the sample volume and vessel type to account for the correct amount of temperature lag. The microprocessor then calculates an optimized thermal profile and directs the block to overshoot its target slightly; it starts timing when the sample temperature itself reaches the set point (lower panel, opposite). By removing some guesswork, calculated control can reduce both optimization time and overall run time. Calculated control is recommended for most applications.

Block Temperature Control



Calculated Temperature Control



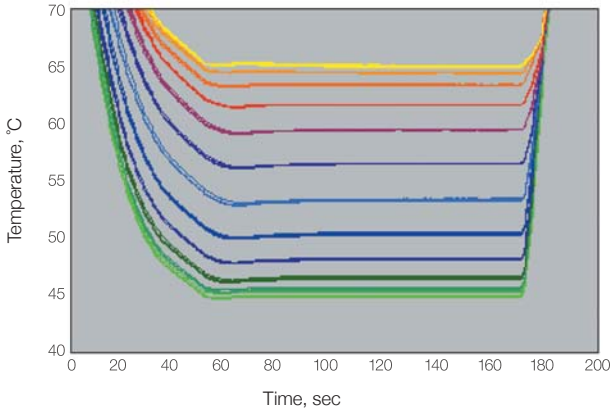
Temperatures were ramped from 60–90°C using a 96-well Alpha unit on a DNA Engine cycler with 0.2 ml tubes and a 25 µl sample volume.

Dynamic Ramping and the Gradient Feature

Multizone technology allows DNA Engine line cyclers to create a highly reproducible temperature gradient across the sample block using software alone. The gradient feature allows optimization of reactions in a single experiment using a range of temperatures simultaneously. Temperature gradients ranging from 1°C up to 24°C can be programmed across a 96-well sample block. The gradient feature employs dynamic ramping, which means that the temperature gradient forms during ramping. All wells come to their designated temperature at the same time, making the incubation period consistent among all samples in the experiment.

Accurate incubation times are crucial for successful transfer of protocols from a gradient to a nongradient mode.

Dynamic Ramping in Gradient Mode



Four thermal cyclers were programmed to develop a 45–65°C gradient across 12 columns. Thermal measurements were taken with NIST-traceable, laser-trimmed thermistors from 48 wells (4 wells/column) in each cycler. Mean temperature of each column in each cycler (48 total traces) is plotted. Note that the software adjusts ramp rates so that all samples reach the incubation temperature at the same time.

Low-Volume Cycling and Robotics

The MJ line is a top choice for high-throughput and automated environments. DNA Engine line cyclers boast the smallest footprint available, are readily networked, and can be remotely operated using a universal set of ASCII commands. Over the years, our scientists have partnered with many leading robotics manufacturers to offer the most flexibility for the incorporation of thermal cyclers into spatially constrained workstations.

For especially tight integrations, we've developed the Remote Alpha Dock™ (RAD) system which allows an Alpha unit to be operated up to 3 m away from any DNA Engine line cycler chassis. The two-bay Dyad Disciple cycler is particularly suited for automation — having the smallest possible per-bay dimensions. Historically, the Tetrad has been the favored instrument for high-throughput laboratories (with a 1,536-sample capacity when equipped with four 384-well Alpha units), while the DNA Engine cycler remains very popular for lower-throughput robotic applications.

Moto Alpha unit and Remote Alpha Dock system (inset)

The Moto Alpha Unit

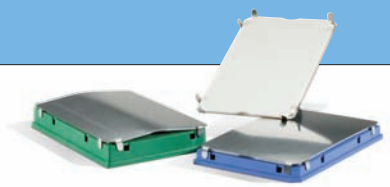
The Moto Alpha unit is the last element needed for fully automated thermal cycling — offering remote lid opening and closing, high-pressure sealing, and a number of other robot-friendly features. When used with Hard-Shell® microplates and Microseal® 'P+' sealing pads, optimal performance can be expected.

Moto Alpha features include:

- Motorized heated lid can be operated directly or remotely
- High sealing pressure is applied evenly across every well
- Active pressure sensing ensures repeatability
- Low volume (1–5 µl) cycling can be performed reliably
- Stainless lifter springs present the microplate 5 mm above the block
- Sealing pressure and opening angle are set with software

Key Accessories for Automation

Hard-Shell 96- and 384-well microplates contain a rigid skirt designed to resist warping and shrinkage due to the thermal stresses of high-temperature cycling. The absence of plate deformation ensures reliable robotic gripping of plates, while maintaining the flatness and well spacing necessary for reproducible pipetting.



Bio-Rad's **arched auto-sealing lids** allow simple automation of sealing, opening, and resealing plates without the need to integrate costly automated sealing and unsealing workstations. Arched auto-sealing lids automatically release from microplates when the cycler is opened, and therefore are ideal for repeated access. In contrast, **flat auto-sealing lids** remain tightly sealed to the microplate for up to 24 hours after cycling, and can be used for short-term storage down to –20˚C. The lids contain sealing pads that are easily cleaned between uses, and are reusable up to 50 times. For cycling of low-volume reactions (1–3 µl), auto-sealing lids form an extremely tight seal and reliably seal when used with the Moto Alpha motorized lid. Evaporative losses of low-volume samples during dispensing are also reduced 5-fold by placing an auto-sealing lid over a reaction plate as soon as the plate is filled.

Microseal 'P+' pads use the same sealing pad as the auto-sealing lids, but in a format that can be adhered directly to the cycler lid. Ejector pins in the lid ensure that the plate will not stick to the lid when the cycler is opened.

Real-Time PCR in 1, 2, or 4 Colors

Real-time quantitative PCR is a highly sensitive technology that combines DNA amplification with simultaneous process monitoring. Accumulation of labeled product is optically monitored as the amplification reaction progresses. By comparing the rates of product accumulation between a set of known standards and a set of experimental samples, the initial quantities of template in the unknown samples can be assessed. Real-time analysis is a powerful technique used in many applications including, gene expression profiling, quantification of DNA and RNA targets, microbial detection, and viral load determination.

Opticon Systems

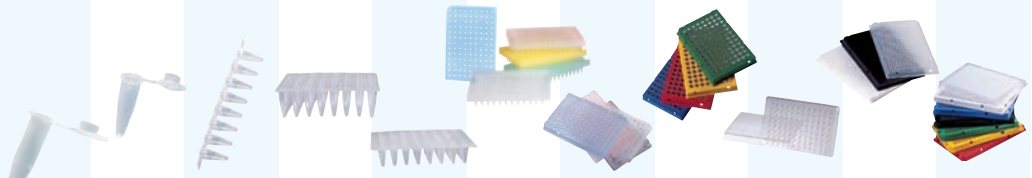
The Opticon and Opticon 2 systems are dedicated real-time detectors that are built around the DNA Engine cycler with a 96-well gradient Alpha unit. These two systems offer one- and two-color detection respectively. Opticon instruments feature a unique optical detection system incorporating fixed-LED excitation and photomultiplier tube detection that provides a broad linear dynamic range of detection, including detection of single-copy targets, without any moving parts.

The Chromo4 Detector

The four-color Chromo4 fluorescence detector allows configuration of a DNA Engine line thermal cycler into a real-time system. The Chromo4 detector, which is mounted to a swappable 96-well gradient Alpha unit, permits multicolor detection for multiplexing or for detection of a variety of targets using various dye chemistries simultaneously. The compact Chromo4 module features a photonics shuttle that can be ordered with customized filter sets, tailoring the detection capability specifically to your needs.

Reaction Vessels and Sealers

Bio-Rad offers a full line of top-quality reaction vessels and sealing systems for thermal cycling applications. DNA Engine line cyclers accommodate a variety of reaction vessels depending on the chosen Alpha unit. Whether you require 0.5 ml or 0.2 ml tubes, high-density microplates, or glass microscope slides, Bio-Rad can outfit you with the appropriate solution for each. A full selection of reliable sealing systems is available for each vessel and can be custom selected based on vessel type, cycling application, and storage method.



	0.5 ml Tubes	Full-Height 0.2 ml Tubes and Strip Tubes	Low-Profile 0.2 ml Strip Tubes	Multiplate™ Unskirted Microplates	Low-Profile Multiplate Unskirted Microplates	Microseal 96-Well Semi-Skirted Microplates	Microseal 96-Well Skirted Microplates	Hard-Shell 96-Well Skirted Microplates	Concord™ 96-Well Skirted Microplates	Microseal 384-Well Skirted Microplates	Hard-Shell 384-Well Skirted Microplates
Alpha block sizes	60, 30	96, 48, 32	96, 48, 32	96, 48, 32	96, 48, 32	96	96	96	96	384	384
Thermal cycling reaction volumes	10–200 µl	5–125 µl	5–125 µl	5–125 µl	5–125 µl	5–125 µl	5–125 µl	5–125 µl	20–150 µl	5–25 µl	3–30 µl
Maximum well volume	600 µl	250 µl	200 µl	330 µl	200 µl	330 µl	220 µl	250 µl	210 µl	40 µl	50 µl
Suggested when using fewer than 96 wells	✓	✓	✓	✓	✓						
Automation-compatible design							✓	✓		✓	✓
Recommended for use with Opticon and Chromo4 systems			✓		✓		✓	✓			

	Microseal 'A' Film	Microseal 'B' Seals	96-Well Sealing Mat	Microseal 'F' Foil	Microseal 'P' Pads	Microseal 'P+' Pads†/ Auto-Sealing Microplate Lids	Chill-out™ Liquid Wax Overlay	Domed Strip Caps	Optical, Flat Strip Caps	Frame-Seal™ Chambers	Hyb-Seal™ Reagent	Self-Seal™ Reagent
Thermal cycling reaction volume	≥10 µl* ≥5 µl**	≥10 µl* ≥5 µl**	≥10 µl	≥25 µl* ≥5 µl**	≥15 µl* ≥10 µl**	≥5 µl* ≥1 µl**	≥2 µl	≥5 µl	≥5 µl	25, 60, 125, or 300 µl	165, 355, or 465 µl	15–150 µl
Recommended for use with Opticon and Chromo4 systems		✓					✓		✓			
Automated sealing possible					✓	✓	✓					
Reusable sealer			✓		✓	✓						
Compatible with cold storage		✓		✓			✓	✓	✓	✓	✓	
Seal can be pierced				✓			✓					
Suggested for sealing tubes	✓						✓	✓	✓			
Seals 384-well microplates	✓	✓		✓	✓	✓	✓					
Seals glass slides										✓	✓	✓

† Designed for use with the new motorized Moto Alpha unit.

* Applies to 96-well format

** Applies to 384-well format

Alpha Unit Specifications

Thermal range	0–105°C (4–100°C for Slide Chambers unit)
Speed of ramping	Up to 3°C/sec (up to 1.2°C/sec for Slide Chambers unit)
Temperature accuracy	±0.3°C of programmed target at 90°C (±0.4°C for dual-block Alpha units and Slide Chambers unit); NIST-traceable
Temperature uniformity	±0.4°C well-to-well within 30 sec of arrival at 90°C (±0.5°C for dual block Alpha units; ±0.6°C well-to-well within 60 sec of arrival at 90°C for Slide Chambers unit)
Lid options	Motorized or manual, all heated and adjustable

Gradient Specifications (96-Well Alpha Units Only)

Gradient accuracy	±0.3°C of programmed target at end columns within 30 sec after gradient step timer starts; NIST-traceable
Column uniformity	±0.4°C, well-to-well within column, within 30 sec of reaching target temperature
Gradient calculator accuracy	±0.4°C of actual well temperature
Lowest temp for gradient	30°C
Highest temp for gradient	105°C
Temperature differential range	1–24°C

Instrument Specifications

PTC-0200
DNA Engine
Thermal Cycler

PTC-0220
DNA Engine Dyad
Thermal Cycler

PTC-0221
Dyad Disciple
Thermal Cycler

PTC-0240
DNA Engine Tetrad 2
Thermal Cycler

	PTC-0200 DNA Engine Thermal Cycler	PTC-0220 DNA Engine Dyad Thermal Cycler	PTC-0221 Dyad Disciple Thermal Cycler	PTC-0240 DNA Engine Tetrad 2 Thermal Cycler
Number of cycling bays	1	2	2	4
Input power	100–240 VAC, 50–60 Hz, 850 W max	200–240 VAC, 50–60 Hz, 1,600 W max, fitted with NEMA L6-20P plug	200–240 VAC, 50–60 Hz, 1,600 W max, fitted with NEMA L6-20P plug	200–240 VAC, 50–60 Hz, 3,200 W max, fitted with NEMA L6-20P plug
Weight	9 kg (chassis and Alpha unit)	16.8 kg (chassis and two 96-well Alpha units)	10.1 kg (chassis only)	21.6 kg (chassis only)
Size (W x D x H)	24 x 35 x 25 cm, chassis and Alpha unit	48 x 29 x 21 cm, chassis and Alpha units	46 x 28 x 21 cm, chassis and Alpha units*	47 x 61 x 21 cm, chassis and Alpha units
Display	20 x 4 alphanumeric LCD	320 x 240 pixels, 256 colors	No display	320 x 240 pixels, 256 colors
Mouse controllable	No	Yes	No	Yes
Ports	IEEE-488 bidirectional general-purpose interface bus, 9-pin RS-232 serial port for printer or remote use, 25-pin 8-bit parallel interface printer port	RS-232, Ethernet, Dyad Disciple expansion	2 USB ports (1 per bay), Dyad expansion	RS-232, Ethernet
Program capacity	400 typical programs; up to 12 password-protected folders	1,000 typical programs	No intrinsic memory — relies on Dyad or external PC	1,000 typical programs

All DNA Engine line thermal cyclers offer: Peltier-effect thermal cycling technology, choice of temperature control mode, interchangeable Alpha units with heated lids, gradient capability (when outfitted with 96-well Alpha units), power failure restore, networking capability and an Instant Incubation option.

* Overall size of a four-bay Dyad/Dyad Disciple system — stacked configuration with rack accessory, 48 x 44 x 62 cm (W x D x H) with Alpha units; linear configuration with baffle accessory, 105 x 29 x 21 cm (W x D x H) with Alpha units.

Catalog #	Description
DNA Engine Thermal Cycler Chassis	
PTC-0200	**DNA Engine Thermal Cycler Chassis** (does not include the Alpha unit — requires 1)
PTC-0220	**DNA Engine Dyad Thermal Cycler Chassis** (does not include the Alpha units — requires 2)
PTC-0221	**Dyad Disciple Thermal Cycler Chassis** (does not include the Alpha units — requires 2)
PTC-0240	**DNA Engine Tetrad 2 Thermal Cycler Chassis** (does not include the Alpha units — requires at least 2 and fits up to 4)
Available Alpha Units	
ALS-1260	**Single Alpha Unit**, holds 60 x 0.5 ml tubes
ALS-1296	**Single Alpha Unit**, holds 96 x 0.2 ml tubes or one 96-well plate
ALS-1238	**Single Alpha Unit**, holds one 384-well plate
ALS-1200	**Single Alpha Unit**, holds microarrays, biochips, flat-bottom vessels
ALD-1233	**Dual Alpha Unit**, holds 2 x 30 x 0.5 ml tubes
ALD-1244	**Dual Alpha Unit**, holds 2 x 48 x 0.2 ml tubes or half-plates
ALD-1234	**Dual Alpha Unit**, holds 30 x 0.5 ml and 48 x 0.2 ml tubes
ALD-0211	**Dual Alpha Unit**, holds 2 x 16 glass slides (for DNA Engine, Dyad, Dyad Disciple cyclers)
ALD-0212	**Dual Alpha Unit**, holds 2 x 16 glass slides (for Tetrad cyclers)
ALP-2296	**Moto Alpha Unit**, holds 96-well plate, with integrated motorized heated lid
ALP-2238	**Moto Alpha Unit**, holds 384-well plate, with integrated motorized heated lid
ALP-2200	**Flat Block Moto Alpha Unit**, customizable flat surface block with four screw-down points, with integrated motorized heated lid and flat inner lid
ALP-2201	**Flat Block Moto Alpha Unit**, customizable flat surface block with four screw-down points, with integrated motorized heated lid and skirted inner lid
CFD-3240	**Chromo4 Real-Time PCR System**, includes optical housing and analysis software (requires additional products)

Catalog #	Description
Cycling Accessories	
RAD-0200	**Remote Alpha Dock System**, for DNA Engine line (requires fan power supply)
RPS-0200	**Fan Power Supply**, for Remote Alpha Dock system
Dyad Disciple Accessories	
DAK-0241	**Rack Accessory**, for a Dyad Disciple system (stacked configuration)
DAK-0242	**Baffle Accessory**, for a Dyad Disciple system (linear configuration)
DAK-0001	**Dyad Disciple USB Accessory Kit**, connects 2 Disciple cyclers to a single PC. Includes USB hub and 5 USB cables
DAK-0000	**Dyad Disciple Power Strip Accessory Kit**, allows 2 Dyad Disciple systems to operate from a single 220 V outlet; includes powerstrip and 2 power cords

For more information on other products featured in this brochure, including the Chromo4 detector and Opticon real-time systems and MJ reaction vessels and sealers, visit our web site at **www.bio-rad.com**

BIO-RAD

Bio-Rad Laboratories, Inc.

Life Science Group

MJ Products web site *www.mjr.com* ***Corporate web site*** *www.bio-rad.com* ***USA*** *(888) 735-8437* ***Australia*** *02 9914 2800* ***Austria*** *(01)-877 89 01* ***Belgium*** *09-385 55 11* ***Brazil*** *55 21 2527 3454* ***Canada*** *(905) 712-2771* ***China*** *(86 21) 6426 0808* ***Czech Republic*** *+ 420 2 41 43 05 32* ***Denmark*** *44 52 10 00* ***Finland*** *09 804 22 00* ***France*** *01 47 95 69 65* ***Germany*** *089 318 84-0* ***Greece*** *30 210 777 4396* ***Hong Kong*** *(852) 2789 3300* ***Hungary*** *36 1 455 8800* ***India*** *(91-124)-2398112/3/4, 5018111, 6450092/93* ***Israel*** *03 951 4127* ***Italy*** *39 02 216091* ***Japan*** *03-5811-6270* ***Korea*** *82-2-3473-4460* ***Latin America*** *305-894-5950* ***Mexico*** *55-52-00-05-20* ***The Netherlands*** *0318-540666* ***New Zealand*** *64 9 415 2280* ***Norway*** *23 38 41 30* ***Poland*** *+ 48 22 331 99 99* ***Portugal*** *351-21-472-7700* ***Russia*** *7 095 721 1404* ***Singapore*** *65-64153188* ***South Africa*** *00 27 11 4428508* ***Spain*** *34 91 590 52 00* ***Sweden*** *08 555 12700* ***Switzerland*** *061 717 95 55* ***Taiwan*** *(886 2) 2578 7189/2578 7241* ***United Kingdom*** *020 8328 2000*