



Thermal Cycling

ODTC® - On Deck Thermal Cycler
for 96 well or 384 well PCR plates



ODTC96 XL
version
for flexible
plate use
and gripping

⊕ Benefits

- ▶ Top thermal performance
- ▶ Precise run time
- ▶ XL: Use low & high profile plates
- ▶ 24/7 automated operation
- ▶ Pipetting during PCR Run

⊕ Features

- ▶ Automated Horizontal Lid
- ▶ Super conductive VCM® Mount
- ▶ Small footprint, low height
- ▶ SiLA communication standard
- ▶ Verification tool optional

Thermal Cycler for Fully Automated Applications

The world's first purpose-designed thermal cycler for on-deck use in robotic workstations



ODTC® - On Deck Thermal Cycler

INTRODUCTION

Our motivation

Automation of molecular biological processes is in high demand for today's genomic workflows, in particular when high throughput and/or high precision is required for human genomics projects or human diagnostics. However, space in the lab is often limited and thus solutions are required that make the most out of existing liquid handling systems with minimal footprint.

World's first purpose-designed On Deck Thermal Cycler

The INHECO On Deck Thermal Cycler (ODTC®) is the perfect instrument if you intend to fully automate processes containing PCR-amplification or other molecular biological routines with fast-changing heating and cooling requirements. The ODTC® fits on the deck of almost any liquid handling instrument, allowing direct pipetting into the disposable located in the ODTC®. PCR plates can be gripped from all directions, enabling continuous 24/7 mode throughput.

The heated lid of the ODTC® opens horizontally and can be operated independently from the heating block. This unique mechanism allows to completely automate multistep-workflows as „hands off“-solution. Opening of the lid has almost no influence on the thermal performance, enabling pipetting during thermal cycling or incubation steps.

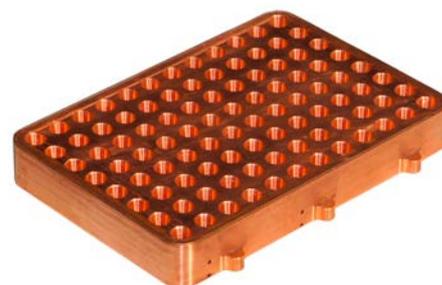
Novel technology with superior thermal performance

The outstanding thermal performance of the ODTC® is made possible by the unique 3D vapor chamber mount (VCM®) technology. This technology (patent pending), is based on the heat pipe principle. Derived from 1D heat pipes and flat 2D vapor chambers that are usually used in laptop computers to cool the chips/processors, the VCM® is the first 3D heat pipe used as super-conductive thermal cycler mount for PCR disposables, with internal heat transfer almost at the speed of sound. As in other thermal cyclers, Peltier elements provide rapid heating and cooling.

But in contrast to the solid silver, aluminum, copper or gold plated mounts in competitor instruments, the VCM® is able to distribute the applied temperature much more evenly and rapidly in the mount. The resulting superior well-to-well uniformity provided by this technology ensures consistent results over all wells, which is one of the most important criteria when doing human diagnostics, as in NGS & respective library preparation for example. The fast transient response with all wells on the same temperature level right after reaching the target plateau temperature allows a reduction of the plateau time and speeding up the whole PCR process.



ODTC® 96, Lid open, with Bio-Rad PCR plate



3D VCM® uncoated

BENEFITS

On deck integration made simple

Save space for integration - gain space for your assay

Most compact cycler integrated on deck: footprint is equivalent to around 2.5 SBS positions only; PCU (power & control unit) separate and can be placed below or next to the deck.

Fits on any deck of almost all liquid handling stations on the market

Ultra-flat design with a height of only 124.3 mm & horizontal lid movement allows save travel of the pipetting arm.

Optimize your assay setup

Flexible deck positioning solutions pre-designed: 4 configurations for the ODTC®96 & ODTC®384 with respect to the air ventilation are available. Please ask the liquid handling supplier of your choice for a desired solution, or contact INHECO GmbH directly for support.

Ultra-high throughput?

Multiple devices can be installed in high density on most liquid handling instruments, depending on brand and model usually up to 4 units, or 10 or even more on 2-deck systems when placed on a shelf that can be served by a respective flexible gripper.



ODTC® top view, open with disposable

Automated PCR, thermal performance at it's best

Same results every day & across all wells

Ensured by superior well-to-well temperature uniformity of +/-0.2K across wells @ 55°C, 72° or 95°C, respectively.

Save time for your workflow, or increase throughput

Very high heating & cooling rates and an ultra-rapid transition into the plateau temperature due to VCM®-based precise thermal regulation characteristics allows short PCR profiles.

Performance guaranteed even with unequally filled wells

E.g. some full & some empty wells – enabled by the innovative 3D VCM® technology, delivering extremely robust temperature performance.



ODTC® closed as during cycling

User-friendly, flexible SiLA based software solution

Time saving, intuitive PCR profile editing

Via one window parametrization tool or, alternatively, step by step programming possible for flexible interaction with the assay. Hands-free adding of further components/chemicals or taking out an aliquot for analysis during incubation processes possible.

Prepared for the future with SiLA communication standard

Enabling plug-and-play solutions.

Test your assay upfront of a liquid handler buying decision

The ODTC® can run stand-alone with a basic testing software.

Use disposables at your choice

State of the art accuracy

Multiple concepts exist to avoid unwanted liquid loss by evaporation. use of in-built sealing mat (easily exchangeable) or usage of disposable automated lids (like the PCR Comfort Lid from Hamilton, or the Bio-Rad Auto-Sealing Lid) or even conventionally sealed plates.

Reduce the risk of cross contamination by avoiding condensation

The heated lid of the instrument is adjustable to any temperature from 30° to 115° C and thus even incubations at low temperature are possible under optimal conditions.



ODTC® open during pipetting

Comfortably select low and high profile plates of your choice

Full- or semi-skirted low profile PCR plates from Bio-Rad, 4titude or Hamilton fit reliably into the mount of the ODTC[®]96 or ODTC[®]384. Note: High profile plates will only fit in the ODTC96 XL.

ODTC96 XL: Use your high profile plate of choice to streamline your workflow by utilising the same plate for all PCR/cleaning/size selection steps. Same performance as in the standard device. Conveniently change between both low and high profile plates in the same instrument.

Safe plate removal

Ejection mechanism triggered upon opening of the lid at the end of the amplification process lifts the plate and avoids gripping problems. Mechanism can be adapted to any type of plate, full- semi- or non-skirted, by simple exchange of the customized ejection bars.

Sealing with Horizontally Moving Lid

The flexible design of the ODTC[®] allows the use of two different sealing options through the horizontally moving lid:

1. Pre-installed fixed ODTC[®] Sealing Cover, opens with lid, easily exchangeable
2. Automation friendly Sealing Lid, e.g. Bio-Rad AutoSealing Lid, 4titude PCR lid, or Hamilton Comfort Lid instead of ODTC[®] Sealing Cover

To prevent accidental contamination of the ODTC[®] instrument and to fully exclude any cross-contamination issues, pre sealing of the plates in combination with sealing covers/lids may be an additional option, depending on your requirements.

The pre-installed ODTC[®] sealing cover and some of the automation friendly sealing lids are designed to be reused a number of times. Please check the manufacturer's specifications for reusability, cleaning procedures and how often the seal may be used.

Productname	Manufacturer	PN	Function
INHECO Sealing Cover	INHECO	5000066	ODTC [®] inbuilt, re-usable
Hamilton ComfortLid	Hamilton	814300	disposable
Bio-Rad Auto-Sealing Lid	Bio-Rad	MSL2022	re-usable
Bio-Rad Auto-Sealing Lid	Bio-Rad	MSL2032	re-usable, gripper version
4titude PCR lid	4titude	4ti-0291	disposable

Unmatched flexibility for any application

Any molecular biological workflow that requires repeated heating or cooling steps and a lid to prevent evaporation of the processed liquid can be realized with the ODTC[®].

Examples are:

- NGS library preparation
- Sanger Sequencing
- End point PCR (i.e. Forensics: STR-Analysis)
- Any assay with changing temperature profiles
- Restriction enzyme digestion
- Incubation with modifying enzymes
- Hybridization

Transient Response & Faster PCR Runs

Due to the use of VCM[®] Technology the transient response of the ODTC[®] is much faster than the response of state-of-the-art thermocyclers using aluminum or silver thermal blocks. All 96/384 wells are on the same temperature level right after reaching the target plateau temperature. This fast transient response allows a reduction of the plateau time and speeding up the whole PCR process.



ODTC[®] plate ejection bars



ODTC[®] is optimized for certain PCR Plates, e.g.: Bio-Rad low profile plate, here shown with Bio-Rad Auto-Sealing Lid



ODTC[®] 384 open without a PCR plate

Variants (wells and ventilation outlet)

ODTC ^{®1}	Part No.	ODTC [®]	Part No.	ODTC [®]	Part No.
96 Left ²	8100100	96 XL Left	8100300	384 Left ³	8100200
96 Back	8100101	96 XL Back	8100301	384 Back	8100201
96 Right	8100102	96 XL Right	8100302	384 Right	8100202
96 Down	8100103	96 XL Down	8100303	384 Down	8100203

¹ Power & Control Unit is identical for all ODTC[®] versions and included in scope of supply.
^{2&3} 96 and 384 indicate the well number. L, B, R, D indicates position of ventilation outlet.



ODTC[®] 96XL

ODTC[®] Verification Tool OVT

The OVT is specially designed to test the performance of the ODTC[®]. Quick, easy & reliable! It's unique flat measuring head captures mount and lid temperatures while the cyclers are closed during the run of a predefined test routine. The OVT is checking heating and cooling rates and the system software automatically calculates the precision and accuracy of the mount and lid temperatures, as well as the temperature uniformity over the mount. Two versions of the OVT, OVT96 and OVT384, are available for verification of the respective ODTC[®] 96/384 well Cycler. The ODTC[®] unit & OVT System information and the test results are shown in a PDF verification document.

Use the OVT for Instrument Qualification (IQ), during Operational Qualification (OQ) and for regular checks to ensure the best performance of your equipment. The guided setup and the automated test routine makes it the ideal tool for service personnel as well as for end-users.



ODTC[®] with OVT
(ODTC[®] Verification Tool)

Main Specifications

Specifications of ODTC [®]	ODTC [®] 96 / ODTC [®] 96XL	ODTC [®] 384
Temperature range	+4°C to +99°C [+39°F to +210°F]	
Temperature accuracy	±0.3K at +55°C [+131°F]	
Temperature uniformity	±0.2K at +55°C [+131°F]	
	±0.2K at +72°C [+162°F]	
Adjustable heating rate	from 0.1 to 4.4 K/sec	from 0.1 to 5.0 K/sec
	from 0.1 to 2.2 K/sec	
Adjustable cooling rate	from 0.1 to 2.2 K/sec	
Heating rate average	max. 4.4 K/sec	max. 5.0 K/sec
Cooling rate average	max. 2.2 K/sec	
Heated lid temperature	adjustable between 30°C to +115°C	

PCR plate types tested for:	ODTC [®] 96	ODTC [®] 384
PCR Plates	- Bio-Rad Hard-Shell [®] HSP-9xxx	- Bio-Rad Hard-Shell [®] HSP-3xxx
	- 4titude FrameStar 96	- 4titude FrameStar 384
	4ti-0960/C	4ti-0384/C/IND
	- Hamilton FramePlate [®]	- Hamilton FramePlate [®]
	814302	814305
for other plates contact sales@inheco.com		

Specifications of ODTC [®] Power & Control Unit, included in ODTC [®] scope of supply	
Interface	Web based protocol, XML files SiLA, Ethernet (RJ45 connector)
Dimensions (WxDxH horizontally placed)	256.5 mm x 414.5 mm x 58 mm Note: The ODTC [®] Power & Control Unit can be positioned vertically or horizontally.
AC input	100-240 V / 50-60 Hz (1250W)
DC output	24 V / (1200W)
ODTC [®] cable length to PCU	3m



ODTC[®] Power & Control Unit (PCU) in horizontal position, alternative: vertical positioning of the Power & Control Unit is possible

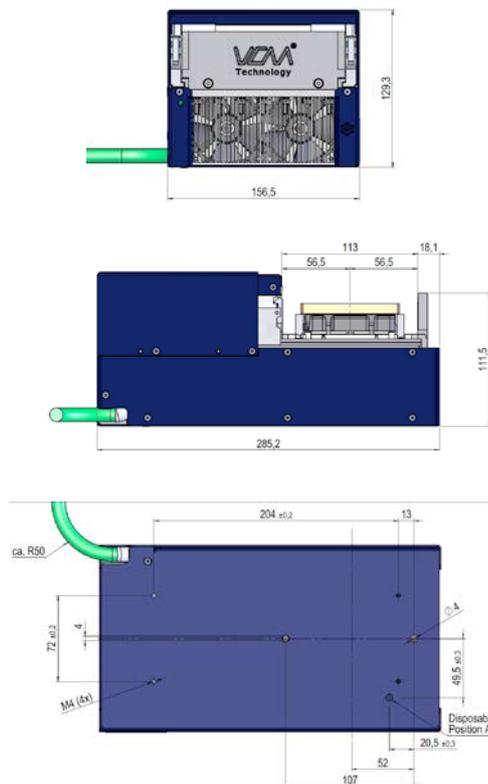
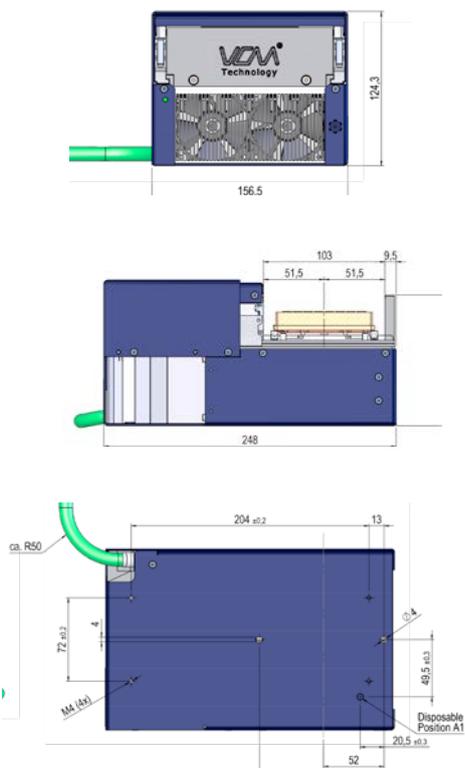


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96 / 384 ODT[®]

ODTC[®] 96 XL



Front view

Side view

Bottom view
 Drilling scheme