

TC-PLUS

Thermal Cyclers

Techne is established as one of the leading suppliers of thermal cyclers, with experience in the design and manufacture of thermal cyclers since 1987. The exciting new TC-PLUS range extends the potential applications to both fast and high-throughput PCR.

The TC-PLUS thermal cyclers have all the latest features from a colour touchscreen to fast ramp rates, along with some innovative additions such as an automatic, non-motorised heated lid, TERS®, thermal energy recovery system and a unique space-saving, stackable design. The TC-PLUS and Satellite units can be combined to form any multi-block format with the Satellites being controllable from either a PC or the TC-PLUS.



Features

- Colour touchscreen for fast program setup
- TERS®, Thermal Energy Recovery System to reduce operational costs
- Stackable design to save on valuable bench space!
- Satellite option which can be controlled by either the TC-PLUS or a PC
- Unique, easy to use CD-type sample drawer mechanism which provides the correct pressure for use with caps: domed or flat, heat OR adhesive seals all without the use of a motor!
- Tm calculator, which uses the Nearest Neighbour algorithm
- Fast ramp rate of up to 5°C/sec
- 4-year warranty*

Efficient cycling

Historically Techne has provided easily interchangeable thermal blocks and the TC-PLUS units are no exception. The three block options, 96 x 0.2ml, 60 x 0.5ml and 384-well plate blocks all have a gradient option, thus enabling easy optimisation of PCR conditions such as Mg²⁺ and primer concentrations and annealing temperatures. To assist with PCR assay design a Tm calculator which uses the Nearest Neighbour algorithm is included, and combined with the gradient every experiment is guaranteed to be optimised first time, every time. The new block design incorporates the very latest in Peltier design and provides one of the fastest ramp rates available at 5°C/sec. One new feature of the thermal block is the TERS® system, Thermal Energy Recovery System which harnesses the released heat during the cooling phase for use in the next heating phase, thus saving energy and reducing operational costs – a must in today's energy conscious world.



Stacked with new features

The TC-PLUS is easy to program with a large, 5.7" VGA colour touchscreen and graphical displays. At least 1000 programs can be stored on the TC-PLUS, so there is more than enough capacity for everyone in the lab! An easy to access USB port on the front of the cycler makes it quick and easy to transfer protocols between both cyclers and laboratories.



Ready to go networking

The TC-PLUS and Satellite units are designed with a front-loading sample drawer to be space-saving, having the unique ability to stack. Bench space is at a premium in the modern laboratory so a TC-PLUS or a Satellite can be stacked onto another Satellite, with a 4-block system only requiring 0.21m². Each TC-PLUS can directly control up to 3 Satellites or 9 via a USB hub. Additionally the Satellites can also be controlled via a PC using the software supplied with every unit.



PCR enabled

Prevention of sample evaporation, particularly with low volume PCR reactions is critical for achieving the right results every time and vital for preventing false negatives. The unique drawer mechanism utilises the energy of the drawer being pushed closed to lower the heated lid into the correct position. It accommodates all consumable types from 0.5ml microtubes to 384-well plates, sealed with either heat or adhesive seals. For applications requiring lower experimental temperatures than standard PCR the heated lid can be set between 35 and 115°C.



Cool thermal performance

Airflow during the heating and cooling phases is vital to the temperature control of the samples, so for improved performance the venting and airflow is now front to back on the TC-PLUS. This also enables side-by-side positioning to further reduce the bench space required.

* 4-year warranty with blocks having a 4-year or 100,000 cycle warranty – whichever comes first.

Purchase of this instrument conveys a limited non-transferable immunity from suit for the purchaser's own internal research and development and applied fields other than human in vitro diagnostics under non-real time thermal cycler patents of Applied Biosystems LLC.

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Interchangeable thermal blocks

All Techne thermal cyclers have thermal blocks which can be interchanged by the user. The truly user-friendly fully interchangeable block system allows blocks to be exchanged in a matter of seconds without the need for special tools. Multiple block formats are available for the different units:

- 1. 96 well block**
Max. gradient 30°C Takes 0.2ml tubes or microtitre plates: non-skirted, semi and fully skirted plates.
- 2. 60 well block**
Takes 0.5ml microcentrifuge tubes
- 3. 384 well block**
Takes non-skirted or fully skirted plates



Sample drawer

The sample drawer is designed to allow easy access to the interchangeable block, as well as operating the heated lid which is brought down onto the sample carrier (a tube set or a micro-titre plate) with the correct 75 newton force to ensure its optimum function. A calibrated spring mechanism brought into operation by the closure of the drawer ensures that the lid cannot be overtightened, thus minimising the risk of sample carrier distortion.

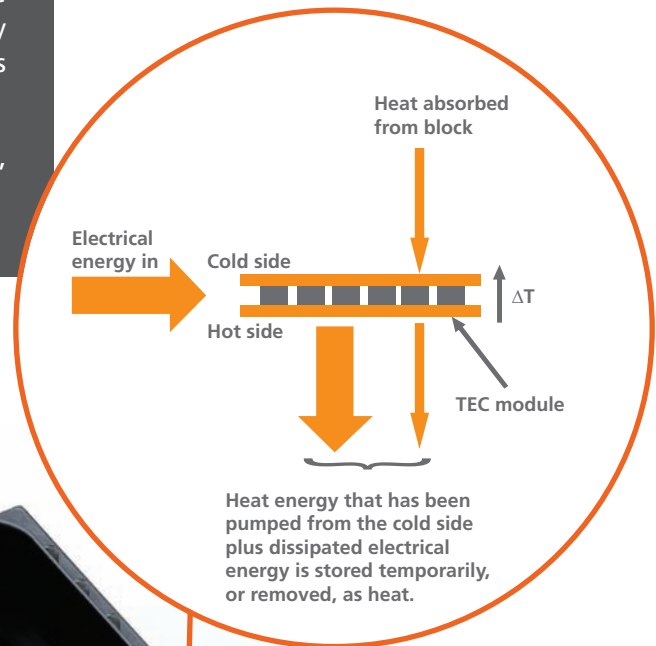
Workbench software

TC-Plus Workbench PC software provides the ability to connect up to 10 Techne® TC-Plus thermal cyclers to one PC, eliminating the need to program each thermal cycler or remember stored program names. With the ability to create and store programs: the intuitive screen layout means creating and storing programs could not be simpler. The Workbench status screen shows the position within a given protocol, time to complete and real temperature countdown for each cycler connected.

Introducing TERS®

One new feature of the thermal block is the TERS® system, Thermal Energy Recovery System which harnesses the released heat during the cooling phase for use in the next heating phase, thus saving energy and reducing operational costs – a must in today's energy conscious world.

The TERS principle also increases heating ramp rates, resulting in faster cycling and shorter run times.



TERS® Feature Operation

The heat sink below the Peltier elements (in the Thermo Electric Cooler, shown above as the TEC module) is used as a heat reservoir as well as a heat dissipation system at key points during the complete thermal cycle, by reducing the fan cooling rate in a calculated manner. This makes stored heat energy available when needed to enable quicker and more economical heating ramps by the Peltier elements than would be possible if all heat extracted during block cooling had been dissipated.

This design feature results in a faster heating ramp rate than would otherwise be possible whilst retaining all the temperature uniformity advantages of a relatively massive aluminium block. The outcome is faster cycle times and improved energy efficiency: around 9% less power is required for 2-step cycling and a saving of nearly 15% for 3-step cycles has been measured.

TERS®: a novel mechanism for controlling thermal cycler blocks
Bates, J. and Johnson, R. Biotech. International XX (2010) pp – pp.

Meet the family...

Techne offers five thermal cycler models, one to fit every users needs. Quality manufacturing, competitive prices and an industry leading 4 year or 80,000 cycle warranty make the Techne series the obvious choice. All models feature Peltier technology, easily interchangeable blocks, intuitive user interfaces and networkable to a PC for ease of control and programming. Compact, robust and versatile, the range includes models to suit every application and budget.

Purchase of any instrument conveys a limited non-transferable immunity from suit for the purchaser's own internal research and development and applied fields other than human in vitro diagnostics under non-real-time thermal cycler patents of Applied Biosystems LLC.



TC-3000

The TC-3000 thermal cycler is unrivalled as the most reliable, low cost personal cycler. Designed with research and teaching laboratories in mind, the TC-3000 offers the ultimate in low cost solutions where ease of use is high on the priority list.

- Space saving small footprint
- Rapid heating rate
- Adjustable heated lid
- Modern intuitive programming
- Ready-to-go templates
- Can link with up to 32 cyclers or to a computer

TC-3000X

The new TC-3000X personal cycler is based on the unrivalled and reliable TC-3000. The new model is ideal for those laboratories that need just that little bit more, with its expanded sample capacity to accommodate 48 x 0.2ml tubes or for convenience, a 48-well plate.

TC-3000G

The world's smallest gradient cycler, the TC-3000G will hold half a 96-well plate, in a horizontal format so that it offers 8 columns for annealing temperature optimisation and 6 rows for optimising reagents such as MgCl₂ and primer concentrations. Annealing temperatures can be optimised over a 15°C gradient between the temperatures of 20 and 80°C.



TC-4000

The TC-4000 is one of the most affordable full sized thermal cyclers in the market, flexible for all your protocols and easy on your budget.

- High performance
- Versatile block format
- Flexible heated lid
- Intuitive programming
- Temperature range 4°C to 99°C
- Excellent heating rate of 2.6°C/sec
- Block uniformity of $\pm 0.3^{\circ}\text{C}$ at 50°C ensures high reproducibility
- 8 peltiers;
- PC/cycler connectivity



TC-5000

The TC-5000 gradient thermal cycler enables you to optimise your experiments at the "touch of a screen", with the same mechanical features as the TC-4000.

- Proven track record
- Graphical display
- Touchscreen
- Excellent heating rate
- Maximum heating rate of 3.0°C/sec and block uniformity of $\pm 0.3^{\circ}\text{C}$ at 50°C
- Wide linear gradient
- Gradient calculator
- Gradient range 20°C to 70°C, maximum 30°C
- Quad Circuit Technology
- 8 Peltier units,

For more information on the Techne range of Thermal Cyclers. Please visit

www.techne.com www.thebestthermalcycler.com

Technical Information

Sample capacity: 0.2ml	96
Sample capacity: 0.5ml	60
Sample capacity: 384-well	Yes
Block temperature range	0 to 100°C*
Block uniformity (without gradient)	<±0.3°C**
Temperature accuracy	<±0.2°C**
Gradient range	Across the full temperature range
Maximum gradient	30°C
Minimum gradient	1°C
Pre-run sample cooling	Yes, at 4°C
Temperature set point adjustment	0.1°C
Maximum heating rate	5°C/s
Minimum heating rate	0.1°C/s
Maximum cooling rate	3.0°C/s
Minimum cooling rate	0.1°C/s
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Selectable heated lid temperature	35 to 115°C or off
Pre-heat lid	Yes
Warm up time from ambient	< 2 min
Over-temperature cut-out	Yes
Regulated heated lid pressure	Automatic
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Program interface	5.7" VGA colour touchscreen with graphical display
Maximum number of programs stored	1000
Maximum number of stages per program	99
Maximum number of steps per stage	99
Maximum number of cycles per stage	99
Programmable ramp rate	Yes, 0.1°C/s steps
Maximum hold time	99h 59m 59s
Minimum hold time	1.0s
Gradient calculator	Yes
Incremental/decremental temperature	Yes
Incremental/decremental time	Yes
Pause facility	Yes
Password protection	Yes
Run completion time	Yes
End of program alarm	Yes (can be disabled)
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Auto re-start on power failure	Yes with options of 10min, 30min, 1h or always
Connection to PC control software	Yes
Software updates	Available from www.techne.com
Tm primer calculator	Yes
Dimensions (L x W x H)	375 x 276 x 312mm
Weight	14kg
Voltage	100-230V, 50-60Hz
Power	

All test performed in 20°C ambient temperature.

*Minimum temperature is 0°C or 20°C below ambient; whichever is higher.

**Block set to 50°C for uniformity and accuracy tests

Ordering Information

Product Code	Description
FTCPLUS/02	TC-PLUS thermal cyler, 96 x 0.2ml
FTCPLUS/05	TC-PLUS thermal cyler, 60 x 0.5ml
FTCPLUS/384	TC-PLUS thermal cyler, 384-well plates
FTCSAT/02	TC-PLUS satellite thermal cyler, 96 x 0.2ml
FTCSAT/05	TC-PLUS satellite thermal cyler, 60 x 0.5ml
FTCSAT/384	TC-PLUS satellite thermal cyler, 384-well plates
FTCPLUS/02/B	TC-PLUS block, 96 x 0.2ml
FTCPLUS/05/B	TC-PLUS block, 60 x 0.5ml
FTCPLUS/384/B	TC-PLUS block, 384-well plates



Bibby Scientific Limited
Beacon Road, Stone, Staffordshire,
ST15 0SA, United Kingdom
Tel: +44 (0)1785 812121
e-mail: sales@bibby-scientific.com
www.techne.com

Bibby Scientific US
3 Terri Lane, Suite 10, Burlington,
NJ 08016, USA
Tel: +1 609 589 2560
e-mail: labproducts@techneusa.com
www.techneusa.com

