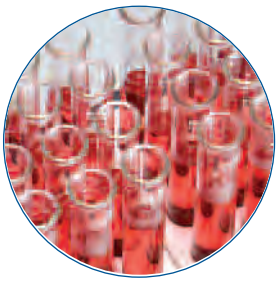
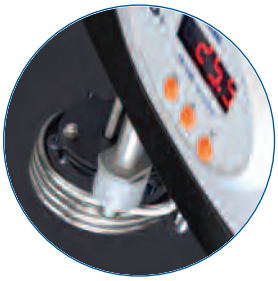
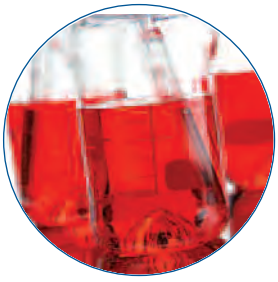
TECHNE

Equipment for the Life Sciences

Contents







iii Introduction

1 Thermal Cyclers

9 Hybridisation Incubators

13 Dri-Block® Heaters

19 Sample Concentrator

21 Gelation Timer

23 Baths and Thermoregulators

30 Dip and Flow Coolers

31 Refrigerated Baths

32 Liquid Calibration Baths

33 Biological Stirrers

36 Cell Culture Vessels

37 Technical Information

47 Ordering Information


TECHNE
Sample Concentrator
TECHNE
TC-512

Welcome to the 3rd edition of the Techne® life sciences equipment catalogue.

Techne® is a long established name and world leader in the manufacture of temperature control and science equipment essential for the life sciences, research, clinical and general laboratory applications.

In this edition we are proud to introduce three new products:

- The new TC-3000 personal thermal cycler: compact and low cost, it offers a fast heating rate and simple to use software with a "speed dial" function to rapidly retrieve stored programs
- The new Twin Control Dri-Block® heater: the space-saving, cost-saving answer if two independently controlled blocks are required
- We have also included the Gelation Timer from our calibration range. This instrument is used to measure the transition from liquid to solid during polymerisation

We hope the improved clarity of the layout makes choosing the correct product easier than ever before. In addition, a new Technical Information section at the back of the catalogue includes many useful facts and figures related to the use of the products.

Techne® products are manufactured in an ISO9001:2000 environment in our ultra modern facility in Stone, Staffordshire. Every step from new product development to after sales service follows documented and traceable procedures. The result is a high standard of service and quality-focused culture committed to total customer satisfaction.

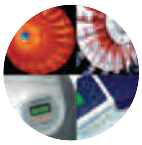
All electrical products produced by Techne conform to the latest safety directives including the European CE requirements. For total compliance, all products are tested and approved by a fully accredited external test house. We are compliant with the Waste Electrical and Electronic Equipment directive, WEEE and the Restriction of the use of Certain Hazardous Substances, RoHS as introduced in 2006.

All the products featured in this catalogue are available through a wide range of national and international distributors. Technical and application advice is available from qualified scientists and electrical engineers based at Stone.

For your local distributor details and up-to-date product information please visit our Techne website at www.techne.com. Here you will also find software downloads, as well as information on news and events, exhibitions and seminars, frequently asked questions, and much more. The Techne® brand is committed to providing the very best life science and temperature control equipment as well as the highest level of service, before, during and after the sale.

Some of the most famous names in science...

We are one of the largest broad based manufacturers of laboratory products worldwide, providing internationally recognised brands with reputations for product quality and high performance. These famous brands are now brought together in a single package to offer an uncomparable level of quality, service and support.



Science Equipment

We manufacture one of the largest ranges of benchtop equipment available under four famous brand names.

- The extensive **Stuart®** range includes block heaters, blood tube rotators, colony counters, hotplates, hybridisation ovens, rockers, shakers, stirrers and water baths.
- **Techne®** is a world leader in the manufacture of temperature control equipment, including water baths, Dri-Block® heaters, and molecular biology products such as hybridisation incubators and thermal cyclers.
- **Jenway®** makes a wide range of scientific instruments including UV/Vis spectrophotometers, flame photometers, colorimeters, portable and laboratory meters for the measurement of dissolved oxygen, pH, conductivity and specific ions.
- **Carbolite®** has built up an enviable reputation for quality and service, manufacturing furnaces and ovens for both standard and completely bespoke applications. All products can be dispatched worldwide from its' custom built modern manufacturing facility in the UK.

Laboratory Glassware

We are one of the world's leading manufacturers of laboratory glassware. Production at the UK plant in Stone, Staffordshire combines the latest technology with the traditional skills of the glassblower to make over 3000 products branded with some of the most famous names in science, including :

- **Pyrex®** borosilicate glassware
- **Quickfit®** interchangeable jointed glassware
- **MBL®** volumetric glassware including burettes, cylinders, flasks and pipettes
- **Rotaflo®** stopcocks for a variety of applications including general purpose and high vacuum usage.

Disposable Plastics

As a pioneer of single use laboratory plastics the Sterilin® brand continues to set world standards for quality and reliability in the life sciences field. With an extensive range of consumables for medical and research laboratories the policy of ongoing improvement means that the **Sterilin®** brand also incorporates a wide range of products for the pharmaceutical, food, dairy and water testing industries.

Cell Biology

Supplying the increasingly sophisticated field of life sciences, we offer one of the widest ranges of biotechnology products available today, including tissue culture plasticware from the leading edge Japanese cell biology company **Iwaki®**.

Reusable Plastics

Leadership in polymer science and many important innovations have combined to make **Azlon®** one of the most widely known and respected brands in durable plastic labware. **Azlon®** reusable plastics cover a broad range of applications in the modern laboratory including bottles, wash bottles, measuring cylinders and beakers. The **Azlon®** fabrication unit can also manufacture specialist plastic products designed to customer requirements.

Silicone Products

Esco® branded products comprise an extensive range of silicone compression and extruded items, including specialist custom made parts. Since 1936 Esco® has established an unrivalled reputation for quality and service of silicone rubber and mouldings to healthcare and an increasingly diverse range of industrial clients.

... all from one company with an unrivalled reputation for quality and service.

Barloworld Scientific - UK (Group HQ).
Beacon Road, Stone, Staffordshire, ST15 0SA,
United Kingdom
Tel: +44 (0)1785 812121 Fax: +44 (0)1785 813748
e-mail: sales@barloworld-scientific.com
www.barloworld-scientific.com

Barloworld Scientific - France
BP79, 77793 Nemours Cedex, France
Tel: +33 1 64 45 13 13 Fax: +33 1 64 45 13 00
e-mail: bsf@barloworld-scientific.fr
www.barloworld-scientific.fr

Barloworld Scientific - Italy
Via Alcide de Gasperi 56, 20070 Riozzo Di Cerro Al Lambro,
Milano, Italy
Tel: +39 02 98230679 Fax: +39 02 98230211
e-mail: marketing@barloworld-scientific.it
www.barloworld-scientific.it

Barloworld Scientific - USA
3 Terri Lane, Suite 10, Burlington, NJ 08016, USA
Tel: +1 609 589 2560 / +1 800 225 9423 Fax: +1 609 589 2571
e-mail: labproducts@techneusa.com
www.techneusa.com

Thermal Cyclers

Thermal Cycler, 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

One of the world's best selling thermal cyclers. At only 561 cm^2, the TC-3000 is even economical on space.

Rapid heating rate

Utilising the latest Peltier technology the TC-3000 can ramp at 3.6°C/sec heating rate and 2.0°C/sec cooling rate.

Proven reliability, high performance

Experience in thermal cycler manufacturing since 1987, ensures that the TC-3000 provides guaranteed performance and quality results, every time.

Heated lid

The adjustable heated lid (100°C to 115°C), designed to reduce the risk of sample evaporation, can be enabled or disabled. The heated lid only comes on if the block is set above 35°C.

Fast-track programming

Modern intuitive programming and ready-to-go templates means creating even the most complicated protocols is simple.

PC control & networking

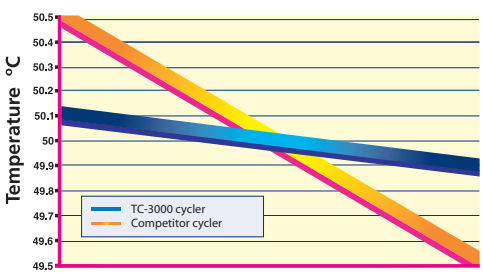
The TC-3000 can be linked together with other Techne cyclers; up to 32 cyclers can be networked to one computer.

Additional benefits

- Temperature range 4°C to 99°C
- Block uniformity of ±0.1°C at 50°C, ensuring optimal reproducibility
- Password protection: protect your program against unwanted modifications
- Portable dual voltage: has a variable voltage selector

Technical Specification

Block formats	
0.5ml capacity	20
0.2ml capacity	25
Block Temperature	
Maximum ramp rate	3.6°C/sec
Block uniformity at 50°C	±0.1°C
Temperature range	4°C to 99°C
Peltier element/block	4
Heated Lid	
Selectable heated lid temperature	100°C - 115°C
Heated lid enable/disable	Yes
Programming	
No. of programs	80
Programming display	4-line alphanumeric
Auto restart on power failure	Yes
Dimension L x W x H	330 x 170 x 190



Graph showing the typical uniformity across the block at 50°C set point on a Techne TC-3000 compared to competitors' cyclers.

Ordering Information

Product Code	Description
FTC3/02	TC-3000 thermal cycler for 25 x 0.2ml microtubes, 120V / 230V
FTC3/05	TC-3000 thermal cycler for 20 x 0.5ml microtubes, 120V / 230V
FTC3/02/B	TC-3000 block for 25 x 0.2ml microtubes
FTC3/05/B	TC-3000 block for 20 x 0.5ml microtubes

Thermal Cycler, TC-412

The TC-412 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

High performance, high sample throughput model for maximum flexibility and economy, and ideal for a larger number of parallel samples.

Versatile block format

The truly user-friendly fully interchangeable block system allows blocks to be exchanged in a matter of seconds without the need for any tools (60 x 0.5ml, 96 x 0.2ml, 96-well fully skirted plates, 384-well or flat plate for *In-situ*).

New design flexible heated lid

Defined pressure, programmable heated lid (100°C to 115°C) to accommodate a variety of consumables. The heated lid only comes on if the block is set above 35°C.

Intuitive programming

4-line display with intuitive, simple-to-use software with alphanumeric programming, password protection, simple copy/edit functions and much more.

- Temperature range 4°C to 99°C
- Excellent heating rate of 2.6°C/sec and block uniformity of ±0.3°C at 50°C, ensuring optimal reproducibility
- 8 peltiers; using the innovative Quad Circuit Technology, the TC-412 ensures unsurpassed control accuracy and temperature uniformity
- The TC-412 can be connected to a PC along with other Techne cyclers for high throughput applications using Gensoft software

Technical Specification

Model	TC-412
Block formats	
0.5ml capacity	60
0.2ml capacity	96
Block Temperature	
Maximum ramp rate	2.6°C/sec
Block uniformity at 50°C	<±0.3°C
Temperature range	4°C to 99°C
Heated Lid	
Selectable heated lid temperature	100°C - 115°C
Heated lid enable/disable	Yes
Over-temperature cut-out	Yes
Programming	
Number of programs	80
Password protection	Yes
Programming display	4-line alphanumeric
Auto restart on power failure	Yes
Dimensions L x W x H (mm)	420 x 220 x 260

Ordering Information

Product Code	Description
FTC4384D	TC-412 thermal cycler for 384-well microplate, 120V / 230V
FTC41S5D	TC-412 thermal cycler for 60 x 0.5ml microtubes, 120V / 230V
FTC41F2D	TC-412 thermal cycler for 96 x 0.2ml microtubes or 96-well fully skirted plate, 120V / 230V
FTC41H2D	TC-412 thermal cycler for 96 x 0.2ml microtubes or 96-wellplates, 120V / 230V
FTC41FLD	TC-412 thermal cycler with flat plate for *In-situ*, 120V / 230V
FTC41B5D	TC-412 block for 60 x 0.5ml microtubes
FTC41BHD	TC-412 block for 96 x 0.2ml microtubes or 96-well plate
FTC41BFD	TC-412 block for 96 x 0.2ml microtubes or 96-well fully skirted plates
FTC41BID	TC-412 block with flat plate for *In-situ*
FTC4B384	TC-412 block for 384-well microplate

ALL BLOCKS WITH EXTENDED WARRANTY
4 years or 80,000 cycles*
*See local distributor for details and conditions.

Thermal Cycler, TC-512

The TC-512 gradient thermal cycler enables you to optimise your experiments at the "touch of a screen", with the same mechanical features as the TC-412.

Proven track record

Over 20 years experience in thermal cycler design ensures that the Techne TC-512 encompasses reliability with all the specifications required for advance protocols.

Graphical display

The 'real-time' graphical display shows the sample temperature profile while the program is running, including the upper and lower limits of the gradient. This pictorial, real-time representation means instant visualisation of your experiment's status.

Touchscreen

The TC-512 incorporates a unique user-friendly programming interface provided by a 115 x 90mm touch-sensitive screen.

Excellent heating rate

A maximum heating rate of 3°C/sec and block uniformity of ±0.3°C at 50°C with or without a gradient...no compromise!

Wide linear gradient

The most linear gradient cycler on the market, with an amazing range of 30°C. Protocols can be optimised in a single experiment.

Gradient calculator

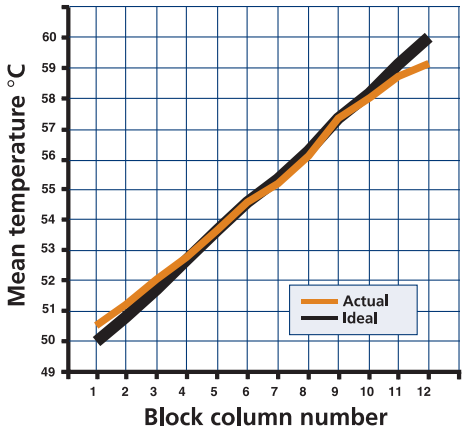
The gradient calculator function displays the temperature of each column of tubes. This ensures replication of the experimental conditions.

- Memory cards[1]: SmartMedia memory cards provide an alternative to internal memory storage of your programs, offering security, and flexibility
- Gradient range 20°C to 70°C, maximum 30°C
- Quad Circuit Technology: Each block consists of 8 Peltier units, controlled by 4 independent temperature thermistors (control sensors) distributed evenly across the block. This ensures that the TC-512 exhibits the most accurately controlled linear gradient available
- Versatile block format: The truly user-friendly interchangeable block system allows blocks to be changed in a matter of seconds without the need for any tools (60 x 0.5ml, 96 x 0.2 ml, 96 x 0.2 ml for fully skirted plates, 384-well, or flat plate for *In-situ*)
- Decremental/incremental time and temperature
- Defined pressure, programmable heated lid
- PC control via Gensoft software with free upgrades available from www.techne.com
  The TC-512 is networkable and can be linked to a single PC together with other thermal cyclers in the Techne range

[1] Not included and must be ordered separately

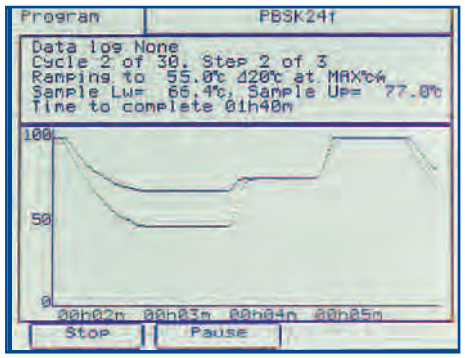
The graph on the right shows the linearity of a 0.2ml **TC-512** cycler block in relation to the ideal linearity. Due to quad circuit technology, the Techne block exhibits an almost perfect linearity with deviations occuring only at block edges where the laws of thermodynamics prevent a perfect linearity from existing.

***TC-512* cycler linearity**



Technical Specification

Model	TC-512
Block formats	
0.5ml capacity	60
0.2ml capacity	96
384-well block	Yes
In-situ block	Yes
Block Temperature	
Gradient range	20°C to 70°C
Maximum gradient[1]	30°C (16°C for 384 block)
Maximum ramp rate[2]	3.0°C/sec
Block uniformity at 50°C	< ±0.3°C
Temperature range	4°C to 99°C
Heated Lid	
Selectable heated lid temperature	100°C - 115°C
Heated lid enable/disable	Yes
Over-temperature cut-out	Yes
Heated lid only comes on if the block is set above 35°C	
Programming	
Number of programs[3]	50 or 500 (with card)
Programming	Touchscreen
Graphical display	Real-Time Graph
Maximum hold time	99 hrs
Minimum hold time	1 sec
Auto restart on power failure	Yes



TC-512 Screen shot

Ordering Information

Product Code	Description
FTC51S5D	TC-512 Gradient thermal cycler for 60 x 0.5ml microtubes,120V / 230V
FTC51H2D	TC-512 Gradient thermal cycler for 96 x 0.2ml microtubes or 96-well plate, 120V / 230V
FTC51F2D	TC-512 Gradient thermal cycler for 96 x 0.2ml microtubes or 96-well fully skirted plate, 120V / 230V
FTC51FLD	TC-512 Gradient thermal cycler for *In-situ* (non-gradient), 120V / 230V
FTC5384D	TC-512 Gradient thermal cycler for 384-well microplate, 120V / 230V
FTC51BHD	TC-512 Gradient block for 96 x 0.2ml microtubes or 96-well plate
FTC51BFD	TC-512 Gradient block for 96 x 0.2ml microtubes or 96-well fully skirted plate
FTC51B5D	TC-512 Gradient block for 60 x 0.5ml microtubes
FTC51BID	TC-512 Flat plate block for *In-situ* (non-gradient)
FTC5B384	TC-512 Gradient block for 384-well microplate

[1] Unavailable for *In-situ* block
[2] Given are typical values of a standard 0.2ml block, in an ambient temperature of 20°C.
[3] Actual numbers are dependent on complexity of the programs.

All Techne cyclers have a full 4-year warranty with blocks having a 4-year or 80,000 cycle warranty – whichever comes first.

Tubes, Plates & Plate Sealing

Microtubes

These thin-walled microtubes have been designed to provide superior performance. The lid is designed to both open easily without the use of tools and form an effective seal when closed to avoid evaporation.

Precision moulded

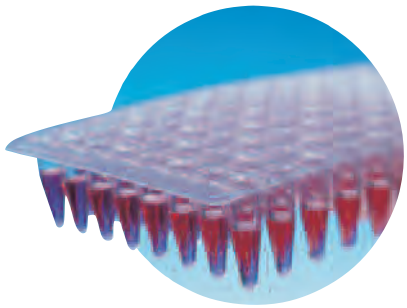
- Made from 99.9% pure virgin polypropylene, they are precisely moulded to achieve good thermal contact with the block

Ultra-thin walls

- Thin walls help to accelerate heat transfer from the thermal block to the sample, enabling shorter cycles

Certified

- RNase, DNase and pyrogen-free ensuring no contaminants arising from the tubes will affect your experiments



Individual microtubes

- For use with all Techne thermal cyclers:
  - 0.2ml thin-walled microtubes, domed caps (natural)
  - 0.5ml thin-walled microtubes, flat caps (natural)

Microtube strips

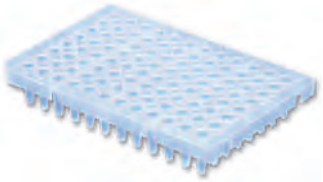
- For use with TC-412 and TC-512 thermal cyclers, strips of tubes are easier and faster to prepare.

Available in 3 formats:

- 0.2ml thin-walled microtubes, 8 per strip (natural), separate strip of 8 flat caps*
- 0.2ml thin-walled microtubes, 8 per strip (natural), attached hinged strip of 8 caps
- 0.2ml thin-walled microtubes, 8 per strip (natural), attached individual caps

Low profile microtube strips

- 0.2ml thin-walled microtubes, 8 per strip (natural), separate strip of 8 optically clear flat caps*



Multi-well plates

High quality, guaranteed RNase, DNase and pyrogen-free.

96-well plate flat-top non-skirted

- For use with TC-412 and TC-512 thermal cyclers
- Seal with heat-sealing foil or film
- Thin-walled polypropylene, maximum capacity 250µl

96-well plate half-skirted, low-profile

- For use with TC-412 and TC-512 thermal cyclers
- Robot friendly
- Seal with 96-mat, 8-strip caps, heat sealing film or foil
- Thin-walled polypropylene, maximum capacity 200µl

96-well plate full-skirted, low-profile

- For use with TC-412 and TC-512 thermal cyclers fitted with full skirted blocks
- Robot friendly
- Seal with 96-mat, 8-strip caps, heat sealing film or foil
- Thin-walled polypropylene, maximum capacity 200µl

384-well microplate

- For use with Techne TC-412 and TC-512 thermal cyclers
- Seal with heat sealing film or foil
- Thin-walled polypropylene plate has a working volume of 25µl, maximum capacity 40µl

* Cap strips must be ordered separately

Thermal Cycler Accessories

Ordering Information

Product Code	Description
FTUB02TW	Pack 1000 x 0.2ml microtubes
FTUB05TW	Pack 1000 x 0.5ml thin-walled microtubes
FMITUBC	Pack 250 strips 8 x 0.2ml microtubes
F96T02	96-well plate, flat top, non-skirted (pack of 25)
F96PLHS	96-well plate, flat top, half-skirted (pack 25)
FMW11	Hi-Temp 96 microplates, skirted (pack of 25)
FMW11/16	Case of 16 packs FMW11 (skirted)
FMIP384	Pack 50 x 384-well microplates

For further part codes and additional information see page 47.

Plate sealing

Silicone mat:

The re-usable silicone mat is the simplest method for sealing 96-well plates. Simply lay over the plate and gently press the lower dimples into the wells.

- Fully autoclavable
- Re-usable: Can be re-used up to 50 times if required
- Dimples on both sides to help locate the mat

Thermo-Seal heat sealing foil and film:

Quick and effective way of sealing any microtitre plate.

- Foil can be pierced easily without ripping or tearing
- Optical heat sealing film can be peeled off after use if required
- Film can be used in conventional thermal cycling or real-time nucleic acid detection

Cap strips:

- Strip of 8 flat caps for use in conjunction with FSTRIP2 only
- Strip of 8 flat caps with very high optical clarity for use with low-profile strip tube (FSTRIP1)

These consumables are certified free from DNase, RNase and human genomic DNA.

Heat sealer:

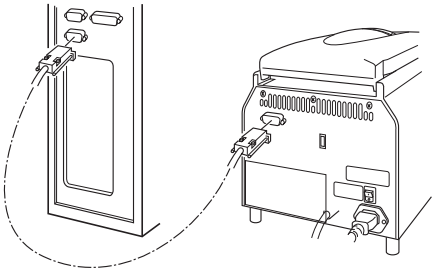
The heat sealer allows 96 or 384-well plates to be sealed in seconds with Thermo-Seal aluminium backed plastic film or clear heat sealing film. Simply load the plate, place the film on the plate and depress the heated element.

- 96 or 384-well plates
- Positive seal: The foil or film is welded to the raised plastic rim of the plates ensuring no leakage can occur
- Use in conjunction with heat sealing foil or film

Ordering Information

Product Code	Description
F96SEAL	96-well sealing mat (pack 50)
FMICAPC	Pack 250 strips 8 x 0.2ml microtube caps
FHSEALSD	Heat sealer, 230 V
FHSPA96	Heat seal plate adaptor for 96-well format
FHSPA384	Heat seal plate adaptor for 384-well format
FHSEAL	Heat seal foil (pack of 100)
FHSFILM	Heat seal film (pack of 100)

For additional information see page 47.



Connecting one unit to the computer using an RS232 cable

Gensoft Cycler PC Control

The user-friendly control software.

Gensoft PC software provides the ability to connect up to 32 Techne thermal cyclers to one PC, eliminating the need to program each thermal cycler or remember stored program names. Any of the Techne thermal cyclers can be connected to each other.

- Create and store programs: the intuitive screen layout means creating and storing programs could not be simpler
- Up to 32 cyclers: programs can be sent to one or multiple units at the same time
- Status screen: the PC status screen shows the position within a given protocol, time to complete and real temperature countdown for each cycler connected
- High-throughput screening made simpler

Download your FREE copy of Gensoft directly from the Techne website www.techne.com

Ordering Information

TC-3000, TC-412 and TC-512 PC Connections

To connect ANY single thermal cycler to a PC:

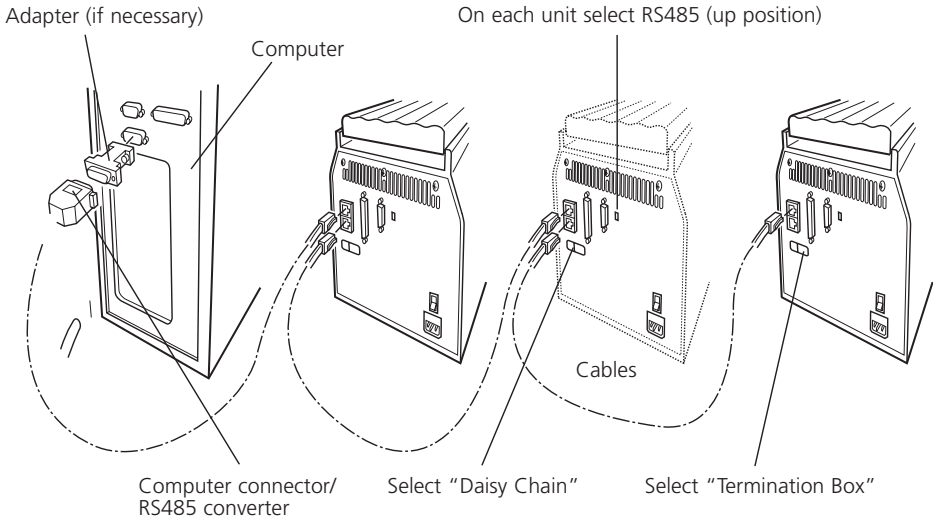
FGEN232	RS232 cable and Gensoft software

To connect TC-3000s and/or TC-412s to a PC, a single powerpack and cable set for the required number of cyclers is required. The power pack includes the PC connector, power pack, terminator box and cable to connect the PC to the first cycler.

FGEN485D	230V Power pack UK and Gensoft software
FGEN485E	230V Power pack EU and Gensoft software
FGEN485P	115V/110V Power pack US and Gensoft software
FGENFOUR	Four cycler cable set (4 connectors + 3 cables)
FGENTEN	Ten cycler cable set (10 connectors + 9 cables)
FGENONE	One cycler cable extension set (1 connector + 1 cable)

If a TC-512 is also being connected the power pack is NOT required and the TC-512 PC connection option should be followed

FTGEN485	PC 485 converter and cable
6103557	Single cycler cable for connecting 2 cyclers together



Connecting multiple units to a computer

Hybridisation Incubators

hybridisation incubators

Hybrigene HB-3D

Hybridiser HB-1D

The flexibility you need with the quality you expect from an established world leader in temperature control instrumentation. Ideal for blotting techniques in which RNA and DNA or protein are immobolised onto nylon nitrocellulose filters.

Hybrigene HB-3D

- Temperature range from 10°C above ambient to 80°C
- High capacity which can hold up to 16 mini or 4 large glass tubes
- Flexibility at an affordable price, offering excellent temperature accuracy and uniformity
- The Hybrigene is the compact, stackable alternative to the Hybridiser HB-1D - for when space is important and throughput is not the priority
- Stack up to 3 ovens, saving on valuable laboratory space

Hybridiser HB-1D

- The famous Hybridiser HB-1D is compact, easy to use and provides complete protection from hybridisation hazards
- A temperature range of +10°C above ambient to 100°C
- High capacity which can hold up to 24 mini-tubes or 6 unique large tubes
- Hybridisations can be performed with a minimal volume of 5ml of probe
- Adjustable feet to enable accurate leveling
- Unique double-glazed glass door; quiet and safe, providing durable protection

Technical Specification

	Hybrigene HB-3D	Hybridiser HB-1D
Maximum glass tube capacity	16	24
Maximum temperature	80°C	100°C
Minimum temperature	10°C above ambient	10°C above ambient
Adjustable rotation speed	0, 5 to 20 rpm	0, 5 to 20 rpm
Adjustable rocking platform	5-20 or 15-60 opm	5-20 or 15-60 opm
Stability in chamber	<1.0°C	<1.0°C
Stability in tubes	<±0.1°C	<±0.1°C
Uniformity in chamber	<±1.5°C	<±1.5°C
Uniformity in tube	<±0.5°C	<±1.0°C
Temp. set point resolution	0.1°C	0.1°C
Absolute accuracy	<±0.3°C	<±0.3°C
Net weight	15kg	20kg
Size L x W x H (mm)	355 x 383 x 432	285 x 385 x 555

Ordering Information

Product Code	Description
FHB4DD	Hybrigene HB-3D hybridisation incubator (no tubes supplied please order separately)
FHB4DDT	Hybrigene HB-3D hybridisation incubator (including 4 large hybridisation tubes FHB16)
FHB1DE	Hybridiser HB-1D hybridisation incubator (no tubes supplied please order separately)
FHB1DG	Hybridiser HB-1D hybridisation incubator (including 3 large hybridisation tubes FHB12)

Hybridisation Accessories

Versatile multiple tube formats; mix and match sizes within an instrument to cater for different throughputs, users and applications.

- Tubes and other accessories can be accommodated at the same time for multiple uses
- Low probe volume, even with large glass tubes. Rotation and design ensure volumes as low as 5ml can be used and recovered
- Unique "slot-in" tubes; with tube rotation speed of 0 to 20 rpm; controllable to suit your application
- New tube holders; each holds up to 16 x 15ml or 8 x 50ml tubes
- Radioactive safe; protective casing and non-drip tube design minimises risk to the user.
- Selectable speed rocking platform; (0 to 60 opm) to cater for membrane-bound and slide-bound hybridisations
- Adjustable feet; for levelling on uneven surfaces
- Static shelf; where heating without movement is required
- Drip tray; removable for easy cleaning

Tubes

Glass hybridisation tubes reduce volumes, simplify washing and improve signals!

- 3 sizes available: small, mini and unique large tubes
- Durable: thick borosilicate glass
- Easy pour: non drip, safe and convenient
- Sealing ring: 'O' ring-sealed end caps ensure no leakage!
- Escape thread on screw cap: easy opening with no vacuum problems
- Tube assemblies: adaptors to hold multiple small glass tubes for increased capacity

For additional information concerning tube dimensions see page 48.

HB-1D Glassware

Ordering Information

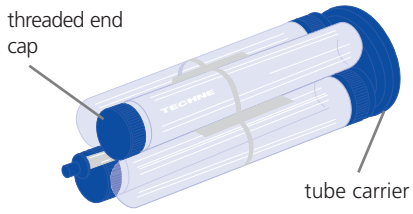
Product Code	Description
FHB11	large glass tube without end caps
FHB12	large glass tube with end caps
FHB32	small glass tube with screw cap
FHB43	multi tube holder for mini tubes HB-1D
FHB41	mini glass tubes with screw caps (pack of 4)
F15ML1TH	tube carrier with clips to hold 16 x 15ml tubes (HB-1D only)
F50ML1TH	tube carrier with clips to hold 8 x 50ml tubes (HB-1D only)

HB-3D Glassware

Ordering Information

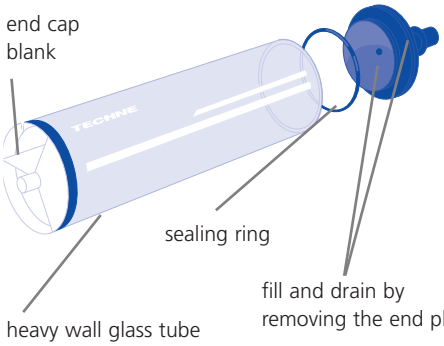
Product Code	Description
FHB16	large glass tube with end caps
FHB36	small glass tube with screw cap
FHB71	small glass tube with screw cap end plug not included (for use with FHB70)
FHB70	multi tube holder for small tubes
FHB72	FHB70 multi tube holder and 3 x FHB71 small glass tubes with screw caps
FHB41	mini glass tubes with screw caps (pack of 4)
FHB61	multi tube holder for mini tubes
F15ML4TH	tube carrier with clips to hold 16 x 15ml tubes
F50ML4TH	tube carrier with clips to hold 8 x 50ml tubes

Mini tube assembly



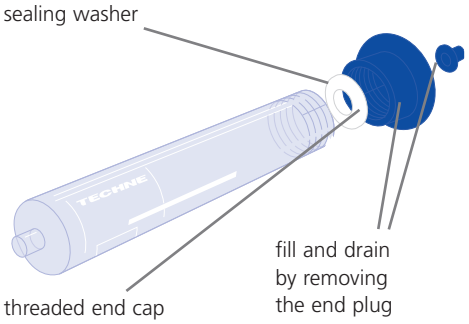
Tubes FHB41
Holder FHB43 (HB-1D only)
Holder FHB61 (HB-3D only)

Large tube (for use without carrier)



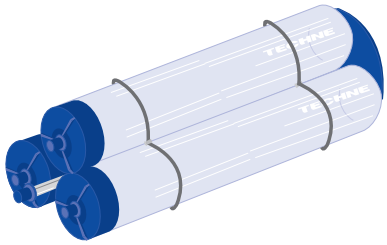
FHB12 (HB-1D only)
FHB16 (HB-3D only)

Small tube (for use without carrier)



FHB32 (HB-1D only)
FHB36 (HB-3D only)

Small tube assembly (HB-3D only)



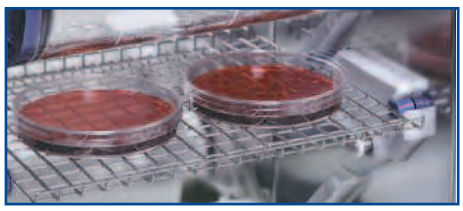
Tubes FHB71
Holder FHB70

Holder F15ML1TH (HB-1D only)
Holder F15ML4TH (HB-3D only)

(Please note: tubes are not supplied)

FHTRACK (tube rack)

Adjustable speed rocking platform



Static shelf

Incubator Accessories

Tube holders

Tube holders with clips, available to carry 16 x 15ml or 8 x 50ml tubes. Ideal for higher throughput of smaller samples.

Selectable speed rocking platform

It sits neatly in the base of the unit while still allowing a number of hybridisation tubes to be placed above. Made from stainless steel, the rocking platform enables membranes to be processed using a wave motion. Speed range of 0 to 60 oscillations per minute.

Static shelf

Up to 2 (Hybrigene HB-3D) or 3 (Hybridiser HB-1D) static stainless steel mesh shelves can be placed into the tube locators allowing the unit to be used as a simple non-motion incubator. Each shelf can hold up to 4kg.

Membrane separators

Strong, re-usable porous mesh sheets for placing between membranes. Ensures even hybridisation when processing multiple hybridisation membranes in one tube. Available in packs of 5 (20x20cm).

Hybridisation tube rack

Useful storage facility for tubes during membrane loading or when not in use. Carries up to 3 large and 3 small tubes.

Ordering Information

Product Code	Description
FHTRACK	HTH-1 tube rack holder (holds 3 large and 3 small tubes)
FMEM2020	Membrane separators 200 x 200mm (pack of 5)
FHB1/PLAT	Rocking platform (HB-1D only) 0-60opm
FHBSH1	Stainless steel mesh shelf (HB-1D only)
FHB4SH1	Stainless steel mesh shelf (HB-3D only)
FHB4/PLAT	Rocking platform (HB-3D only) 0-60 opm
FHB4WALL	Hybrigene HB-3D incubator wall fixing kit
FHB4DKIT	Complete kit for stacking 3 Hybrigene HB-3D units

Dri-Block®
Heaters

Dri-Block® Heaters

Techne's Dri-block® heaters provide a safe, dry, constant temperature source in the laboratory. The units are particularly suitable for microbiology and clinical laboratories for incubation, boiling, inactivation, wet ashing, sample concentration, enzyme analysis and many other clinical and industrial purposes.

- Very accurate temperature control
- Analogue or digital control
- Choice of 2 or 3 block format
- Wide range of interchangeable aluminium blocks
- Blocks available as accessories for all applications - tubes, vials and microplates
- Block extraction tool is supplied, allowing blocks to be removed easily
- 3-year warranty as standard

DB-2A

DB-2A

- Small, light and compact footprint, economical price
- Can hold up to 2 aluminium insert blocks or one 96-well plate block
- Analogue: temperature setting is by a calibrated dial
- Temperature range from ambient to 100°C
- Fast heat-up rate: 30°C to 100°C in just 12 minutes
- Temperature stability at 40°C: ± 0.05°C

DB-2D

DB-2D

- Bright orange LED digital display for fast and accurate setting of temperature
- RS232 connection available for PC control
- Can hold up to 2 aluminium insert blocks or one 96-well plate block
- Temperature range from ambient to 100°C
- Fast heat-up rate: 30°C to 100°C in just 12 minutes
- Temperature stability at 40°C: ± 0.05°C

Technical Specification

		DB-2A	DB-2D
Temperature range		Ambient to 100°C	Ambient to 100°C
Temperature stability	@ 40°C	±0.05°C	±0.05°C
	@ 100°C	±0.1°C	±0.1°C
Temperature setting		Rotary knob	Push button
Temperature display			Red LED 3 digits
Temperature scale graduation		2°C	No graduation
Maximum temperature variation between identical blocks @ 40°C		0.2°C	0.2°C
Set point accuracy		±2°C	±1°C
Maximum number of blocks		2	2
Heat up time, minutes	30-37°C	8	8
	30-56°C	9	9
	30-Max.	12	12
RS232 option available		No	Yes
Power supply		230V, 50 Hz	230V, 50 Hz
Overall size L x W x H (mm)		202 x 260 x 105	202 x 260 x 105

Ordering Information

Product Code	Description
FDB02AD	DB-2A ambient to 100°C, requires 2 insert blocks
FDB02DD	DB-2D ambient to 100°C, requires 2 insert blocks
FDB02DDR	DB-2D + RS232 ambient to 100°C, requires 2 insert blocks

DB-3

- The DB-3 is designed to hold up to 3 aluminium insert blocks or one 96-well plate block
- Analogue: temperature setting is by a calibrated dial
- Temperature range from ambient to 100°C
- Fast heat-up rate: 30°C to 100°C in just 18 minutes
- Temperature stability at 40°C: ± 0.05°C

DB-3

DB-3A

- Temperature range from ambient to 200°C for higher temperature applications
- Can hold up to 3 aluminium insert blocks or one 96-well plate block
- Analogue: temperature setting is by a calibrated dial
- Powerful heater for fast heat-up rate: 30°C to 100°C in just 12 minutes
- Temperature stability at 40°C: ± 0.1°C

DB-3A

DB-3D

- Can hold up to 3 aluminium insert blocks or one 96-well plate block
- Bright orange LED digital display for fast and accurate setting of temperature
- Temperature range from 25°C to 200°C
- Powerful heater for fast heat-up rate: 30°C to 200°C in just 25 minutes
- Interchangeable insert blocks to accommodate a variety of tubes
- Temperature stability at 40°C: ± 0.1°C

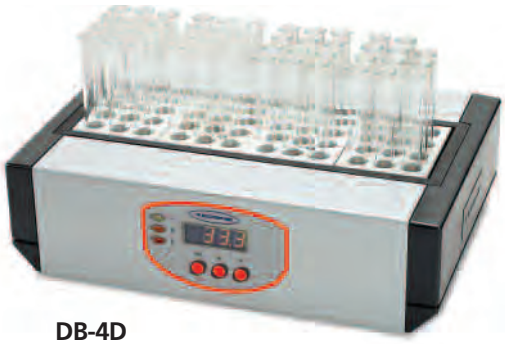
DB-3D

Technical Specification

		DB-3	DB-3A	DB-3D
Temperature range		Ambient - 100°C	Ambient - 200°C	ambient - 200°C
Temperature stability	@ 40°C	±0.05°C	±0.1°C	±0.1°C
	@ 100°C	±0.1°C	±0.15°C	±0.15°C
Temperature setting		Rotary knob	Rotary knob	Push Button
Temperature scale graduation		2°C	2°C	No graduation
Maximum temperature variation between identical blocks	@ 40°C	0.2°C	0.2°C	0.2°C
Set point accuracy		±2°C	±2°C	±1°C
Maximum number of blocks		3	3	3
Heat up time, minutes	30-37°C	8	8	11
	30-56°C	12	12	15
	30-Max.	18	30	25
RS232 option available		No	No	Yes
Power supply		230V, 50 Hz	230V, 50 Hz	230V, 50 Hz
Overall size L x W x H (mm)		279 x 260 x 105	279 x 260 x 105	279 x 260 x 105

Ordering Information

Product Code	Description
FDB03OD	DB-3 ambient to 100°C, requires 3 insert blocks
FDB03AD	DB-3A ambient to 200°C, requires 3 insert blocks
FDB03DD	DB-3D ambient to 200°C, requires 3 insert blocks
FDB03DDR	DB-3D + RS232 ambient to 200°C, requires 3 insert blocks



DB-4D

DB-4D

- Can hold up to 4 aluminium insert blocks or two 96-well plate blocks
- Bright orange LED digital display for fast and accurate setting of temperature
- Temperature range from ambient to 100°C
- Powerful heater for fast heat-up rate: 30°C to 100°C in just 15 minutes
- Interchangeable insert blocks to accommodate a variety of tubes
- Temperature stability at 40°C: ±0.1°C

Technical Specifications

		DB-4D
Temperature range		Ambient to 100°C
Temperature stability @ 40°C		±0.1°C
Temperature setting		Push button
Temperature display		Orange LED, 4 digits
Uniformity within block at 40°C		0.1°C
Uniformity within block at 100°C		0.1°C
Set point accuracy		±1°C
Maximum number of blocks		4
Heat up time, minutes	30-37°C	3
	30-56°C	11
	30-Max.	15
Heater power		600W
Power supply		230V, 50 Hz
Overall size L x W x H (mm)		356 x 260 x 105

Ordering Information

Product Code	DB-4D
FDB04DD	DB-4D ambient to 100°C, requires 4 insert blocks
FDB04DDR	DB-4D + RS232 ambient to 100°C, requires 4 insert blocks

DB-2TC, Twin Control

DB-2TC

A new Dri-Block® heater with an innovative design accommodating two blocks with independent digital temperature controls. Each block can be set at different temperatures - ideal for multiple users or for applications where samples have to be transferred between two temperatures very quickly.

The compact, robust design also allows the unit to be placed in fume cabinets where corrosive/toxic chemicals are used.

Operating over the temperature range of ambient to 100°C the unit has an impressive heat up rate and highly accurate thermal control with temperature stability of ±0.1°C.

- Ideal for multiple users or applications
- Two blocks with independent temperature controls
- Can hold up to 2 aluminium insert blocks
- 4-digit setting with bright orange LED digital displays for fast & accurate setting of temperature
- Powerful heater for fast heat-up rate: 30°C to 100°C in just 19 minutes
- Temperature range from ambient to 100°C
- Temperature stability at 40°C: ±0.1°C

Technical Specification

		DB-2TC
Temperature range		Ambient to 100°C
Temperature stability @ 37°C		±0.1°C
Temperature setting		Push button
Temperature display		Orange LED, 4 digits
Uniformity within block at 37°C		±0.1°C
Uniformity within block at 100°C		±0.1°C
Display resolution		0.1°C
Set point accuracy		±1°C
Maximum number of blocks		2
Heat up time, minutes	30-37°C	6 minutes
	30-56°C	14 minutes
	30-Max.	19 minutes
Heater power		2 x 150W
Power supply		230V, 50 Hz
Overall size L x W x H (mm)		279 x 260 x 105

Ordering Information

Product Code	Description
FDB02DDTC	DB-2TC ambient to 100°C, requires 2 insert blocks

Aluminium Blocks

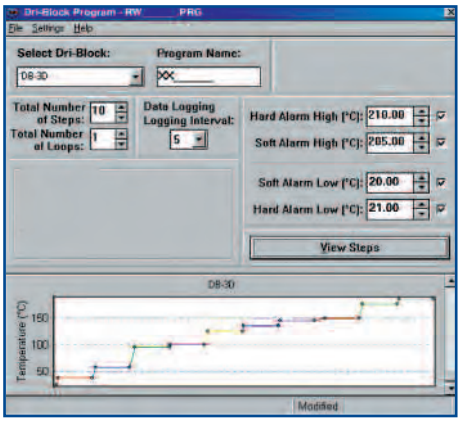
Accessories, Interchangeable Blocks

For use with Techne block heaters. Manufactured from anodised aluminium and all with a separate hole to accommodate a thermometer if desired. All blocks have dimensions (d x w x h) 95 x 76 x 51 mm and can be used in any combination.*

*Excludes 96-well blocks

Aluminium Insert Blocks

Product Code	Tube Size (diam)	Number of Holes	Size d x w x h (mm)
F3501	Plain Block	None	95 x 76 x 51
F3502	6mm	30	95 x 76 x 51
F3503	10mm	20	95 x 76 x 51
F3504	12mm	20	95 x 76 x 51
F3505	13mm	20	95 x 76 x 51
F3506	15mm	12	95 x 76 x 51
F3507	16mm	12	95 x 76 x 51
F3508	19mm	8	95 x 76 x 51
F3509	25mm	6	95 x 76 x 51
F3510	10mm cuvettes	2 channels	95 x 76 x 51
F4460	Plain block	thermometer hole only	95 x 76 x 51
F4461	7 and 9 mm	20/10	95 x 76 x 51
F4462	24mm	6	95 x 76 x 51
F4463	26mm	6	95 x 76 x 51
F4464	1.5ml microcentrifuge tubes	20	95 x 76 x 51
F4465	0.5ml microtubes	30	95 x 76 x 51
F4466	Plastic spacer	None	95 x 37 x 51
F4467	Hi-Temp 96 block	96	95 x 151 x 61
F4468	Falcon round bottom plate block	96	95 x 151 x 61
F4469	Falcon flat bottom plate block	96	95 x 151 x 61
F4470	2.0ml microcentrifuge tubes	20	95 x 76 x 51
F4471	0.2ml microtubes	72	95 x 76 x 51
F4473	Block for 96 x 0.2ml microtubes	96	95 x 151 x 61
F4474	1.0ml Porvair Plate	96	95 x 151 x 48
F4476	Block for Gelation timer	1 sample cup	95 x 76 x 51



DBsoft

Software DB-2D/DB-3D-4D

DBsoft has been designed for use with Dri-Block® models DB-2D, DB-3D and DB-4D. DBsoft is a Windows® based program that connects via an RS232 connection to your computer.

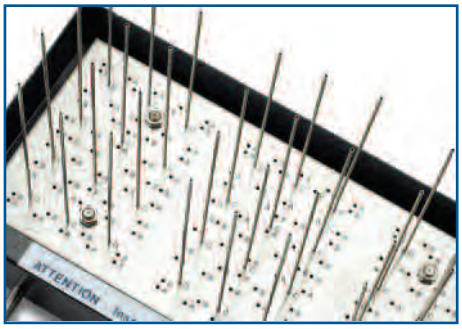
Programs can be created, saved and loaded at any time as well as running in real time mode. Definable parameters include time, temperature and ramp rates. Temperatures within the range of ambient to 200°C can be programmed.

DBsoft enables you to:

- Create, open, save and print programs
- Open, save, print and view logged data as a line graph
- Open, print and view logged data in a text format
- Create calibration certificates
- Run a program in real time mode
- Send programs to the Dri-Block®
- Retrieve programs from the Dri-Block®
- Retrieve test results from the Dri-Block®
- Erase test results
- Password protect
- Obtain full on-line help

Sample Concentrator

Two models available, one for test tubes, cuvettes and small containers (FSC400D) and one for 96-well plates (FSC496D).



Patented gas chamber

Sample Concentrator

The Techne Sample Concentrator accelerates the concentration of large numbers of samples in a matter of minutes where traditional methods can take hours. It is ideal for the life science researcher and scientist; designed for applications such as sample preparation for analytical techniques including drug screening, hormone assays, chromatographic analysis and scintillation counting.

Unique gas chamber

Evaporation is increased by passing an inert gas over the surface of the sample. The gas travels through the unique patented gas chamber to the samples via the needles. The needles are set into a silicone matrix and can be spaced to fit any combination of tubes.

Compact

The unit is light and compact enough for convenient use in a fume cupboard when toxic solvents are being evaporated.

Needles

The needles are made from high quality stainless steel and are specially designed for use with the Techne Sample Concentrator. The needle configuration can easily be adjusted to fit any combination of tubes, from 26mm test tubes to 0.5ml microcentrifuge tubes. Where corrosive solutions are being used, Teflon coated needles are available.

Fully adjustable

The Sample Concentrator's gas reservoir is mounted on a fully adjustable stand for accurate height control.

Technical Specification

Maximum gas pressure	Must not exceed 2 psi
Maximum vertical travel	320mm
Maximum gas usage	15 litres / minute
Gas	Any inert gas (often Nitrogen)
Gas intake nozzle diameter	6.35mm (1/4")
Needle position	Variable to suit Techne Dri-Blocks®
Overall size L x W x H (mm)	295 x 240 x 530
Net weight (gas chamber and stand)[1]	4kg

Ordering Information

Product Code	Description
FSC400D	Sample Concentrator gas reservoir and stand only[1]
FSC496D	Sample Concentrator gas reservoir and stand only (96-wells)
Needles[2]	
F7209	Pack of 100 needles, 76mm long
F7210	Pack of 100 needles, 127mm long
FSC4NCS	Pack of 100 PTFE coated needles, 76mm long
FSC4NCL	Pack of 100 PTFE coated needles, 127mm long

[1] The Sample Concentrator comes complete with gas chamber and stand. Two models are available, one for test tubes, cuvettes and small containers (FSC400D) and one for 96-well plates (FSC496D). A DB-3 Dri-Block heater and insert blocks are also required.

[2] Needles are not included with Sample Concentrator and must be ordered separately.

Gelation Timer

Gelation Timer

Techne® has been setting the benchmark for gelation timing for almost 60 years. In fact, several British Standards for this methodology were written using our equipment. Gelation timers are used to measure the transition from liquid to solid during polymerisation.

All models have digital timers, with the time in 1 minute increments (GT-5) up to 9999 minutes or in tenths of a minute up to 999.9 minutes. Every unit is supplied with the usual Techne® quality guarantee, including a calibration certificate for traceability. Before leaving the factory each instrument is calibrated and certified.

A bright LED shows the time to the nearest minute or tenth of a minute, and an audible bleep and light confirm completion of gelation.

The Techne® Gelation Timer is the ideal instrument for accurate measurement and quality control for the gelation of resin or adhesive based samples in the laboratory.

- Digital timer: 2 models available, 1rpm and 10rpm
- Stops automatically when gelation occurs
- Easy to use, push button display
- Can be mounted on a retort stand for ease of use
- Plungers are removable for easy cleaning
- Sample cups and disposable plungers are available
- 3 year warranty

Ordering Information

Product Code	Description
FGT5	GT-5 digital gelation timer, 1rpm
FGT6	GT-6 digital gelation timer, 10rpm

Accessories

Product Code	Description
F0985	22mm stainless steel plunger
F0979	19mm stainless steel plunger
F0982	16mm stainless steel plunger
F1794	Pack of 100 disposable plungers
F1795	Disposable plunger adaptor
F7846	Pack of 240 sample cups

Baths
& Themoregulators

Water Baths

A comprehensive range of temperature controlled water baths are available from Techne. Twenty different water bath combinations allow the use of accurate temperatures from -40°C up to 200°C; ensuring a solution for most laboratory applications.

First select the unheated stainless steel bath (see page 25) which has the appropriate volume for the application, for example B-26 which has a volume of 26 litres.

Then add a thermoregulator (see page 26) which is suitable for the required temperature range, for example the TE-10D Tempette is a digital controller for temperatures between -40°C and 120°C.

Both gabled and flat lids are available for all bath sizes. Gabled lids allow particularly tall tubes to be accommodated.

If sub-ambient temperatures are required it is necessary to add a cooling mechanism to the bath. Techne recommends the use of a dip or flow cooler for temperatures down to -35°C. For example the RU-200 can lower temperatures down to -20°C. It is also possible to use the cooling coil with a water supply for temperatures from 5°C above the water temperature to ambient.

For accessories and ordering information see the following pages….

To assemble the complete system shown opposite the following products are required:

Product Code	Description
FBATH26	B-26 unheated 26 litre bath
FTE10DDC	TE-10D
FFLAT18	Flat lid for 18 or 26 litre bath
FRU2D	RU-200 dip cooler

Unheated Baths

Designed to be used with a clip-on Tempette or Tempunit® thermoregulator, these baths incorporate carrying handles for added safety. All baths have stoved enameled steel outer cases and are supplied with bridge mounting plate to hold the thermoregulator.

Polypropylene spheres can be used to create a ball blanket so as to reduce evaporation and heat loss, whilst providing instant access to the bath.

B-8

Four bath capacities – 8 litres (B-8), 12 litres (B-12), 18 litres (B-18) and 26 litres (B-26)

- Stainless steel construction
- Seam-free and corrosion resistant stainless steel inners for easy cleaning
- Rugged splash-proof case
- Integrated carrying handle
- Maximum working temperature of 200°C
- All models come with a 3 year warranty as standard

B-12

48 litres (B-48)

- 48 litres capacity
- Welded construction
- All submerged parts are made from stainless steel
- Rugged splash-proof case
- Maximum working temperature of 200°C

B-18

Technical Specification

Capacity litres		8	12	18	26	48
Size (mm)	Length	265	354	530	530	594
	Width	325	325	325	325	365
	Height	172	172	172	222	298
Internal Dimensions (mm)	Length	240	329	505	505	559
	Width	300	300	300	300	330
	Height	150	150	150	200	274
Top of bath to liquid level max depth (mm)		65	65	65	65	65
Working length to thermoregulator (mm)		115	205	380	380	430
Working depth - max/min (mm)		130/100	130/100	130/100	180/150	255/224
Working capacity - max/min (litres)		8.0/6.0	11.6/8.4	18.0/13.2	26.0/20.5	48.5/42.5

For temperatures up to 250°C we recommend the use of the LCB range of baths.

B-48

Ordering Information

Product Code	Description
FBATH08	B-8 stainless steel bath, 8 litre capacity
FBATH12	B-12 stainless steel bath, 12 litre capacity
FBATH18	B-18 stainless steel bath, 18 litre capacity
FBATH26	B-26 stainless steel bath, 26 litre capacity
FBATH48	B-48 stainless steel bath, 48 litre capacity

TE-10A

Techne® invented the "Clip On" thermoregulator in 1948, and now offer four "Clip On" units. Thermoregulators are designed to be used with the Techne® unheated water baths or any other suitable laboratory vessels. They will heat, circulate and safely control the temperature of the liquid in the bath within precise limits.

TE-10A Tempette

- Temperature range of -20°C* to +95°C
- Excellent temperature stability: ±0.01°C at 40°C
- Simple to use analogue control
- Suitable for most routine laboratory applications
- User adjustable over-temperature cut-out for unbeatable safety

TE-10D Tempette

- Temperature range of -40°C* to +120°C
- Excellent temperature stability: ±0.01°C at 40°C
- 4 digit setting with a bright LED digital temperature display
- Suitable for most routine laboratory applications
- User adjustable over-temperature cut-out
- Low liquid level cut-out as standard

Technical Specification

Specifications to DIN 12876	TE-10A	TE-10D
Temperature range °C*	-20°C to +95°C	-40°C to +120°C
Temperature selection	Analogue	Digital
Temperature stability using water @ 40°C	±0.01°C	±0.01°C
Pump capacity litres/minute	10	10
Pump capacity (mbar)	145	145
Method of control	Proportional	PID
Temperature sensor	Thermistor	PRT
Adjustable over-temperature cut-out	Yes	Yes
Low liquid level cut-out	Yes	Yes
Heating/Pumping		
Nominal heater power at 120V (W)	1000	1000
Nominal heater power at 240V (W)	1000	1000
Dimensions		
Extension below base (mm)	145	145
Overall size L x W x H (mm)	237 x 124 x 260	237 x 124 x 260

* Refrigeration or cooling coil required for below ambient cooling (see page 30 for Techne Flow and Dip Coolers and page 28 for the cooling coil).

Ordering information

Product Code	Description
FTE10ADC	TE-10A, analogue thermoregulator, -20°C to 95°C, (supplied with clamp)
FTE10DDC	TE-10D, digital thermoregulator, -40°C to 120°C, (supplied with clamp)

TE-10D

TU-20D Tempunit®

- A wider temperature range of -40°C* to +200°C
- Excellent temperature stability: ±0.005°C at 40°C
- 1.8kW heater power for fast heat up
- 4 digit setting with a bright LED digital temperature display
- This unit incorporates an RS232 connection
- User adjustable over-temperature cut-out
- Low liquid level cut-out as standard

TU-20D

TU-20HT Tempunit®

- This sophisticated Tempunit® covers a wide temperature range of -40°C* to +250°C
- Excellent temperature stability: ±0.005°C at 40°C
- 1.8kW heater power for fast heat up
- 4 digit setting with a bright LED digital temperature display
- RS232 connection supplied with Thermsoft software package and connecting lead as standard
- User adjustable over-temperature cut-out with an audible alarm fitted
- Low liquid level cut-out as standard

Technical Specification

Specifications to DIN 12876	TU-20D	TU-20HT
Temperature range °C*	-40°C to +200°C	-40°C to +250°C
Temperature selection	Digital	Digital
Temperature stability using water @ 40°C	±0.005°C	±0.005°C
Method of control	Proportional	PID
Temperature sensor	Thermistor	PRT
Adjustable over-temperature cut-out	Yes	Yes
Low liquid level cut-out	Yes	Yes
PC Interface	Yes RS232	Yes RS232
Heating/Pumping		
Pump capacity litres/minute	10	N/A internal circulation only
Pump capacity (mbar)	145	-
Nominal heater power at 120V (W)	1500	1500
Nominal heater power at 240V (W)	1800	1800
Cooling coil	No	Option
Dimensions		
Extension below base (mm)	145	145
Overall size L x W x H (mm)	237 x 124 x 260	237 x 124 x 260
Thermsoft software package	Accessory#	Standard

* Refrigeration or cooling coil required for below ambient cooling (see page 30 for Techne Flow and Dip Coolers and page 28 for the cooling coil).

Downloadable free of charge from www.techne.com (see page 29)

TU-20HT

Ordering Information

Product Code	Description
FTU20DDC	TU-20D, advanced thermoregulator with RS232, -40°C to +200°C, (supplied with clamp)
FTU20HDC	TU-20HT, advanced high temperature thermoregulator with RS232, -40°C to +250°C, (supplied with clamp)

Liquid Bath Accessories

Cooling coil

Connects to the mains water supply, the water being circulated through the coil should be at least 5°C cooler than the set bath temperature.

Thermometers

Alcohol or mercury-in-glass types are available, please enquire.

Flat and gabled lids

Manufactured of stainless steel and available to fit all sizes of temperature controlled bath to help prevent evaporation losses. Gabled lids provide extra working headroom within the bath.

Adjustable trays

Supported by a ball chain and clip the stainless steel trays can be used to alter the depth of the bath.

Polypropylene spheres

A ball blanket is an effective way of reducing evaporation and loss of heat from a water bath. It acts as effectively as a lid, whilst providing instant access to the bath. Supplied in packs of 250 x 25mm diameter spheres.

Refrigeration control pack

Used in conjunction with the Thermsoft software and Tempunit® models TU-20D and TU-20C, when the program calls for cooling using RB-5A/12A/22A refrigerated baths (page 31) and dip or flow cooler (page 30).

Cooling water control pack

Used in conjunction with Thermsoft software and Tempunit® models TU-20D and TU-20HT (page 27) when tap water is being used for cooling. Tap water can only be used to cool the bath if the temperature of the tap water is at least 5°C cooler than the operating temperature of the bath.

Ordering Information

Flat Lids	
FFLAT08	8 litre size
FFLAT12	12 litre size
FFLAT18	18 and 26 litre size
FFLAT48	48 litre size
Gabled Lids	
FGABLE08	8 litre size
FGABLE12	12 litre size
FGABLE18	18 and 26 litre size
FGABLE48	48 litre size
Adjustable Trays	
FADJ08	8 litre size
FADJ12	12 litre size
FADJ18	18 litre size
FADJ26	26 litre size
FADJ48	48 litre size
Refrigeration control pack	
FCP1D	Refrigeration control pack, 120/230 V (can be supplied fitted)
Cooling water control pack	
FCP2D	Cooling water control pack, 230V
FCP2P	Cooling water control pack, 120V
Thermosoft software	
FTUSOFT	Thermsoft software diskette only
FTU232	Thermsoft software diskette and RS232 cable

Thermsoft

Thermsoft has been designed for use with Tempunit® model TU-20D and TU-20HT control units and thermostatic baths. Thermsoft is a windows based program that connects via an RS232 connection to your computer.

Programs can be created, saved and loaded at any time as well as running in real time mode. Definable parameters include time, temperature and ramp rates.

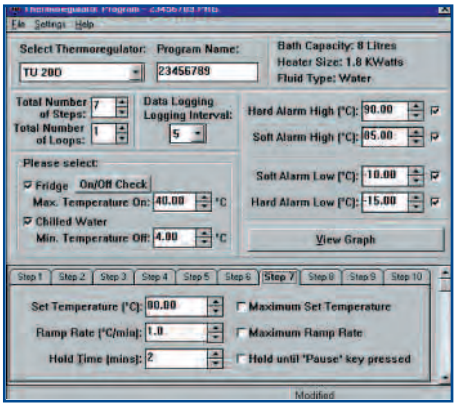
Temperatures within the range of -40°C to 250°C can be programmed. For temperatures below ambient, cooling coils (see page 28) and refrigeration units (see page 30) are available for connection to the system and can be controlled via Thermsoft.

Thermsoft enables you to:

- Create, open, save and print programs
- Open, save, print and view logged data as a line graph
- Open, print and view logged data in a text format
- Create calibration certificates
- Run a program in real time mode
- Send programs to the thermostatic bath
- Retrieve programs from the thermostatic bath
- Retrieve test results from the thermostatic bath
- Erase test results
- Password protect
- Obtain full on-line help

TU-20D

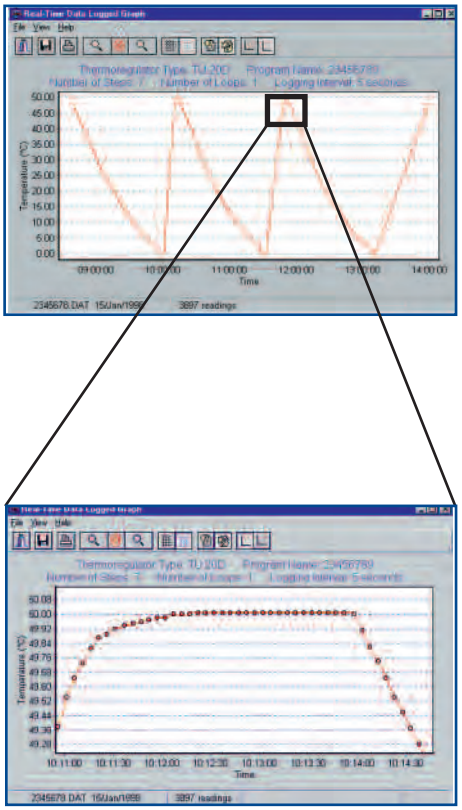
TU-20HT



Screen 1

Shows step 7 of a 10-step program with a single loop (runs program twice). Step 7 has a ramp speed of 1.0°C/min to a set point of 80°C.

Using a Techne refrigeration unit (see page 30) in conjunction with a refrigeration/water control pack (see page 28) the thermoregulator (see page 26) can be programmed to:



Screen 2

Typical logged data from a programmed run with the ability to zoom in on any area of the graph. Clicking on any point will display the reading number, the temperature and the time the reading was taken.

Thermsoft is available free of charge from **www.techne.com**

Dip and Flow Coolers

RU-200 and FC-500 models

The Techne Flow Coolers work in conjunction with a Techne thermoregulator (see pages 26 and 27). They continually extract heat from the bath fluid by means of the heat exchanger which is built into the unit. The cooling head of the Techne Dip Cooler fits neatly and unobtrusively into the corner of the bath and can be secured with a specially designed mounting bracket (supplied). If cooling can be achieved by using cold tap water, a dip cooler is recommended as it conserves water and is easier and more convenient to use.

Techne Dip and Flow coolers are designed for use at below ambient temperatures down to -35°C.

- Four models
- Compact refrigeration units for achieving temperatures down to -35°C*
- Cooling head of the Dip Cooler fits neatly into the corner of a Techne liquid bath (RU Series Dip Coolers)
- Designed for use with Techne liquid baths

Technical Specification

		FC-200	FC-500	RU-200	RU-500
Minimum achievable temperature (°C)		-20	-35	-20	-35
Cooling capacity: 20°C (Watts)		140	210	145	240
Cooling capacity: 0°C (Watts)		140	210	145	240
Cooling capacity: -10°C (Watts)		110	200	110	230
Internal capacity (ml)		200	200	–	–
Nominal dimensions (excluding handles/coil) Overall (mm) -	width	235	370	235	370
	length	420	430	420	430
	height	300	325	300	325
Coil dimensions (mm)	length	–	–	85	85
	diameter	–	–	75	75
Hose length to coil (mm)		–	–	1250	1250

*At an ambient of 20°C, using a mixture of 40% water, 40% antifreeze and 20%

Ordering Information

Model#	Description
Circulators and flow coolers	
FC-200	FC-200 flow cooler, -20°C
FC-500	FC-500 flow cooler, -35°C
Dip coolers	
RU-200	RU-200 dip cooler, -20°C
RU-500	RU-500 dip cooler, -35°C
FCC01	Cooling coil

For product codes see page 52

FC-200

Refrigerated Baths

These baths are a complete refrigerated circulating system for open or closed applications for temperature ranges from -35°C to 100°C. Each bath is supplied with a lid and bridging plate.

There are three bath capacities: 7 litre (RB-5A), 12 litre (RB-12A) and 22 litre (RB-22A). Temperature control is via one of the four thermoregulators and together they offer a choice of 12 different bath combinations.

- Circulating bath with built in refrigeration
- Temperature range from -35°C to 100°C
- Three different capacities of refrigerated bath; 7, 12 or 22 litre
- The combination of 3 circulating baths and 4 thermoregulators provides 12 options

RB-12A

Technical Specification

Cooling (at 20°C ambient)	RB-5A	RB-12A	RB-22A
Minimum achievable temperature (°C)[1]	-20	-35	-30
Cooling capacity at 20°C (W)	145	240	240
Cooling capacity at 0°C (W)	145	240	240
Cooling capacity at -10°C (W)	110	230	220
Dimensions			
Overall Size - L x W x H (mm)[2]	430 x 250 x 566	430 x 370 x 610	430 x 395 x 565
Liquid surface to top of bath - max (mm)	65	65	65
Internal dimensions - L x W x H (mm)	192 x 151 x 200	208 x 300 x 150	360 x 295 x 220
Working length to thermoregulator (mm)	224	224	250
Working depth - max/min (mm)	180/135	130/85	200/160
Working capacity - max/min (litres)	7.0/5.5	11.6/9.6	22/18
Shipping weight kg[3]	31	53	61

[1] Using a mixture of 40% water, 40% antifreeze, 20% alcohol to achieve -35°C. 20 litres/minute pressure 15 litres/minute suction.
[2] Overall size with controller
[3] Add thermoregulator and bath shipping weight to get shipping weight of complete bath system.

Ordering Information

Product Code	Description
FRB5D	RB-5A bath, 5 litre capacity with built in refrigeration unit, -20°C to 100°C
FRB2D	RB-12A bath, 12 litre capacity with built in refrigeration unit, -35°C to 100°C
FRB22D	RB-22A bath, 22 litre capacity with built in refrigeration unit, -30°C to 100°C

RB-5A

Liquid Calibration Baths

The Techne liquid calibration bath (LCB) series offer compact, accurate and reliable liquid baths which can be used for external circulation or temperature calibration of thermal sensors.

- -35°C to 250°C
- Three different capacities available; 5, 7 or 12 litres
- Temperature stability; ±0.005°C depending on choice of control unit
- Fully insulated bath for excellent heat retention
- Analogue or digital temperature selection
- Includes cover, lid and bridging plate

When temperature calibration is required the compact liquid baths offers excellent stability over the entire temperature range. The LCBs can be also be used for external circulation to maintain temperatures of samples in viscometers, photometers, refractometers, fermenters and other reaction vessels.

All models of LCB offer high pump performance and exceptional thermal stability up to 250°C. The baths are fully insulated on all sides and base and are fitted with a cooling coil for connection to a cold water supply for use at temperatures around ambient. The minimum temperature achievable is -35°C when a Dip or Flow Cooler is added to the system.* For the full specifications of the thermoregulators see pages 26 and 27.

Each bath is supplied complete with lid, drain tap, carry handles and hole to position a certified sensor.

The Thermosoft software package is available for the TU-20 thermoregulators free of charge from www.techne.com (see page 29 for details).

Technical Specification

	5 litre	7 litre	12 litre
Overall size L x W x H (mm)	351 x 260 x 183	351 x 260 x 233	351 x 260 x 358
Thermoregulator L x W x H (mm)	237 x 124 x 260	237 x 124 x 260	237 x 124 x 260
Bath opening (mm)	140 x 140	140 x 140	140 x 140

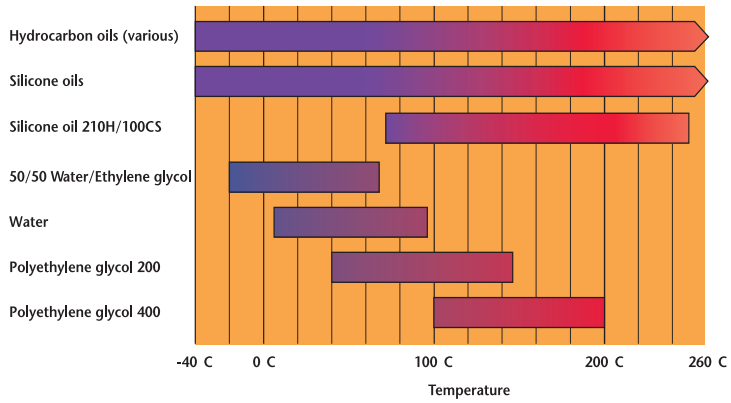
Ordering Information

Product Code	Description
FBCAL05D	LCB insulated liquid calibration bath with cooling coil, 5 litre capacity
FBCAL07D	LCB insulated liquid calibration bath with cooling coil, 7 litre capacity
FBCAL12D	LCB insulated liquid calibration bath with cooling coil, 12 litre capacity

*LCB baths fitted with a TU-20HT thermoregulator are not suitable for use with a Dip or Flow Cooler.

Choice of liquids

Some liquids can be hazardous when used in thermostatic baths. The user should ensure that due regard is paid to the flash-point and other characteristics of the chosen liquid. This table does not represent the recommendations of Techne but may be of assistance to the user in making an initial selection.



Biological Stirrers

Computer generated image of flow pattern generating a gentle controlled spiralling movement of the cell culture, upwards in the middle and downwards at the sides.

Biological Stirrers

The stirrers are designed for optimal suspension cell culture and the use of microcarriers.

A system comprises of a stirrer platform and a number of glass culture vessels.

- Five stirrer platform sizes are available, along with 7 sizes of culture vessel
- Speed range from 0 to 80rpm
- Softstart for slow acceleration and deceleration
- Interval setting option
- Stainless steel stirrer platform with locators for the culture vessels
- Designed for incubator environments

Unique stirring action

The culture vessels incorporate a unique base design which, together with the bulb-ended stirrer, ensures that the cells are lifted into suspension at the lowest possible speeds. This gentle stirring action promotes high cell yields.

The stirrers create virtually no heat so there is negligible heat transfer from the magnetic drive to the culture vessel, making the system suitable for use in both incubators and cold rooms.

Calibrated speed control and interval stirring

Cell attachment to microcarriers and high cell yields are ensured by the special softstart/stop design and interval stirring option. The former ensures slow acceleration and deceleration of the stirrer, avoiding excessive turbulence in the culture media and eliminating cell damage. The interval stirring can be used during the attachment phase to further reduce agitation of the media or when culturing particularly fragile cells.

MCS-101L

MCS-101L

- Accommodates one large vessel; either 3 or 5 litres
- Strong, rugged and lightweight

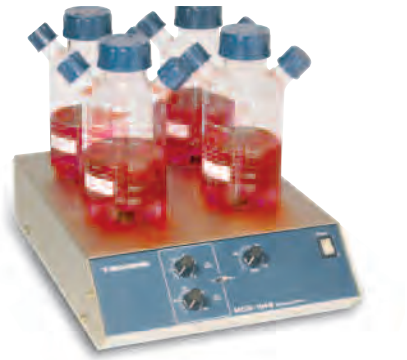
MCS-102L

MCS-102L

- Holds up to two 1 litre culture vessels
- Small, light and compact and space saving

MCS-104S

- Compact version of the MCS-101L
- Hold up to four 500ml culture vessels
- Small, light, compact and space saving



MCS-104S

MCS-104L

- Holds up to four 1 litre cultures vessels
- Strong, rugged and lightweight

MCS-104L

MCS-104XL

- 4 extra large vessels
- Accommodates four 5 litres culture vessels
- Designed for large-scale production
- Strong, rugged and lightweight

MCS-104XL

Technical Specifications

	All models
Speed	
Speed range	0 to 80rpm
Speed setting accuracy	< ± 3rpm
Softstart speed control	20 second acceleration 20 second deceleration
Interval stirring	
Variable on-time	6 seconds to 5 minutes
Variable off-time	2 minutes to 2 hours
Limited operating conditions	40°C and 95% relative humidity (non-condensing)
Power supply	Dual Voltage 230/110V 50/60Hz
Nominal power consumption	2W
Fuse rating	100mA

Technical Specifications

Specifications unique to each model	MCS-101L	MCS-102L	MCS-104S	MCS-104L	MCS-104XL
Vessels per system	1	2	4	4	4
Maximum vessels size, ml	5000 (3000 min.)	1000	500	1000	5000 (only)
Width (mm)	395	140	250	395	530
Depth, including mains plug (mm)	495	400	365	495	595
Height, excluding vessel locators (mm)	90	90	90	90	90
Net weight, excluding vessels (kg)	6.5	3.0	4.1	6.1	11.5

Ordering Information

Product Code	Description
FMCS101L	MCS-101L biological stirrer
FMCS102L	MCS-102L biological stirrer
FMCS104S	MCS-104S biological stirrer
FMCS104L	MCS-104L biological stirrer
FMCS104X	MCS-104XL biological stirrer

Cell Culture Vessels

The culture vessels can be sealed for use with pathogenic materials. The stirrer rod design eliminates rotating bearings within the culture vessels, avoiding the difficulties arising from attempts to clean and autoclave conventional vessels.

The stirring system uses Pyrex® borosilicate glass culture vessels and stirrer rods which are siliconised to reduce the possibility of cells attaching to and growing on the surfaces. Vessels are available with nominal working volumes of 125ml, 250ml, 500ml, 1 litre, 3 litre (all with two side necks) and 5 litre (with two or five side necks).

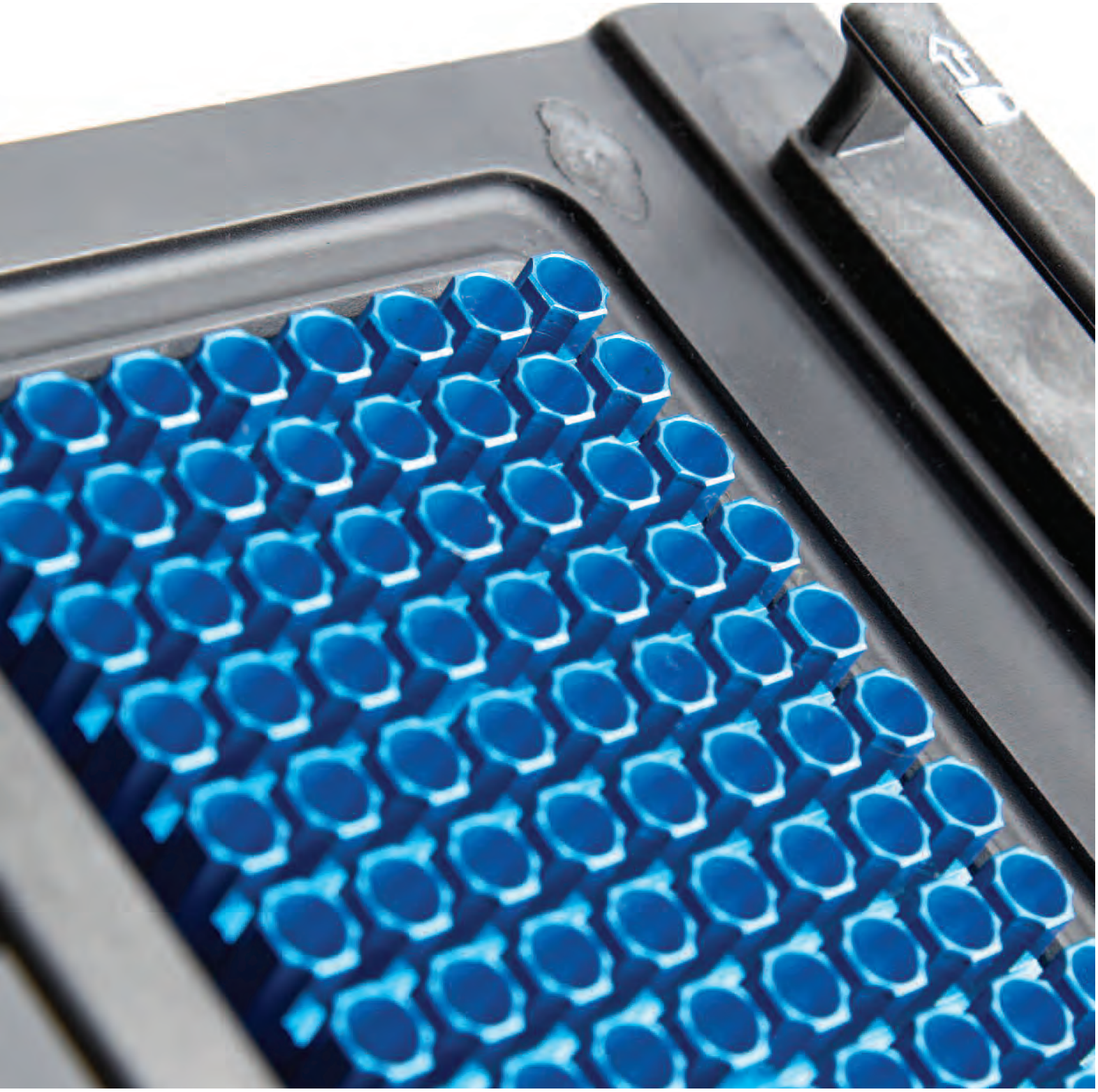
Note that you must order culture vessels to suit your needs; they are not supplied with the MCS platform.

Technical Specification

	125ml	250ml	500ml	1 litre	3 litre	5 litre	5 litre
Filled volume, ml	250	500	1000	2000	6000	10000	10000
Nominal working volume, ml	125	250	500	1000	3000	5000	5000
Working volume range, ml	50 –175	100 –350	200 – 700	500 –1500	1500 – 3500	2000 – 7000	2000 – 7000
Height, mm	145	170	205	263	284	365	365
Diameter, mm	65	80	100	140	215	240	240
Top cap–thread size (mm)	42	42	42	60	60	60	60
Side cap–thread size (mm)	20	20	30	42	42	24	42
Port size (mm)	14	14	23	33	33	18	33
No. of side necks	2	2	2	2	2	5	2

Ordering Information

Product Code	Description
F7988	Culture vessel, 125ml
F7689	Culture vessel, 250ml
F7607	Culture vessel, 500ml
F7608	Culture vessel, 1 litre
FA298	Culture vessel, 3 litre
FA296	Culture vessel, 5 litre, 5 neck
FA709	Culture vessel, 5 litre, 2 neck



Technical Information

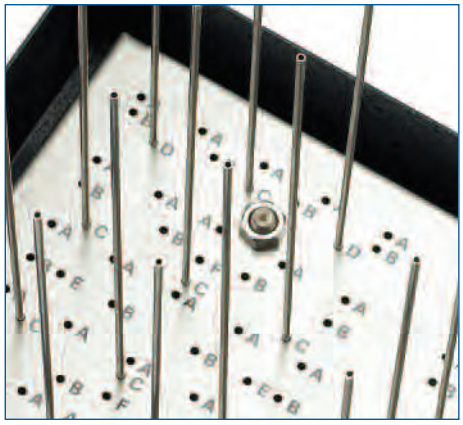
Service and repair

Our dedicated service staff are on hand to help in the unlikely event that your Techne® equipment develops a fault. Please contact them by one of the following means with a clear description of the problem:

E-mail: service@barloworld-scientific.com

Tel: +44 (0) 1785 810475

Fax: +44 (0) 1785 810471



On occasion it may be necessary for your equipment to be sent back to our service department for repair. In this case please contact the service department for a reference number, which you should include with your faulty equipment. Please also ensure you include a clear description of the fault and a completed copy of our decontamination certificate, to certify that the returned item is not contaminated with any harmful substance. The decontamination certificate is available as a download at www.barloworld-scientific.com, or contact us and we will be happy to fax you a copy. Please clearly mark the package for the attention of the service department and post to the following address:

Service Department

Barloworld Scientific

Beacon Road

Stone

Staffordshire

ST15 0SA

United Kingdom

All replacement parts are guaranteed for 6 months and wherever possible returned equipment is turned around within 5 working days.

Please contact our service department for further information on onsite repairs and equipment calibration services.

Technical Support

Techne have a dedicated Technical Support team who are on hand to help with any applications advice and questions you may have about our products and how to use them. The team is made up of experienced laboratory scientists whose backgrounds include chemistry, biochemistry, cell and molecular biology. There are two fully equipped laboratories which are used for developing applications, testing new products and assisting with customer protocols.

We aim to respond to queries on the same day if at all possible. If you have any technical queries concerning any of our products you may call our dedicated Technical Support phone line or email us at the following address:

E-mail: technehelp@barloworld-scientific.com

Tel: +44 (0)1785 810433

Fax: +44 (0) 1785 810471

CE Conformity

We rigorously test our electrical products against the CE and safety standards in place. In addition, the majority of our products are independently tested by an accredited test house. This is reinforced by comprehensive technical and manufacturing data which is available for inspection upon request. Copies of the Conformity Certificates may be downloaded from our website: www.barloworld-scientific.com

Epsilon
Compliance

Compliance Certificate

In accordance with
European Directive 89/336/EEC as Amended by European Directive 93/68/EEC
"EMC Directive"

European Directive 73/23/EEC as amended by European Directive 93/68/EEC
"Low Voltage Directive"

Date: 10th August 2006

Certificate Number: Epsilon 06TEST2095

Project Number: ETS2010

Report Numbers: RETS(E)2010/A/1 and RETS(L)2010/A/2

Manufacturer: Barloworld Scientific Limited
Stone
Staffordshire
ST15 0SA
UK

Epsilon hereby declares that the product:

TC3000 Techne Thermal Cycler

Are in Compliance with the requirements of the listed directives.

Equipment Specification: The full product specifications are listed in reports number RETS(E)2010/A/1 and RETS(L)2010/A/2

The following Harmonised European Standards have been applied:

EN 61326: 1997 + Amendments (Electrical Equipment for Measurement, Control and Laboratory use).
EN 61010-1: 2001. (Safety Requirements Electrical Equipment for Measurement, Control and Laboratory use)
EN 61010-2-010: 2003 (Particular requirements for laboratory equipment for the heating of materials).

This Certificate May Only Be Used In Its Entirety and Without Change

On Behalf of Epsilon Compliance.

Stephen I. D'Henin
Certification Manager
Epsilon Compliance

Epsilon Compliance (UK),
Drury Lane, Drury, Buckley, CH7 3DU, UK.
Telephone: +44(0)1244 541551
Fax: +44(0)1244 543888

WEEE & RoHS Regulations

The Waste Electrical and Electronic Equipment ("the WEEE Regulations- Directive 2002/96/EC") legislation is now in place in the UK. The primary purpose of the WEEE directive is the prevention of waste electrical and electronic equipment, and to require the re-use, recycling and other forms of recovery as to reduce such waste disposal to landfill or incineration.

The Restriction of the Use of Certain Hazardous Substances in Electrical and Electronic Equipment Regulations 2005 ("the RoHS Regulations- Directive 2002/95/EC") have now been passed into UK legislation. The primary purpose of these regulations is to restrict the use of lead, mercury, cadmium, hexavalent chromium, polybrominated biphenyls (PBB) or polybrominated diphenyl ether (PBDE) in new electrical and electronic equipment put on the market in the European Union after July 1, 2006.

As a responsible manufacturer, Barloworld Scientific will comply with such regulation as it affects our products, and will continue to promote "clean" environmental manufacturing practices.

ISO

Our quality assurance system was first approved in 1993, and is currently certified to the International Quality Standard BS EN ISO 9001:2000. This means that Techne is committed to providing the highest quality products, services and customer satisfaction.

The scope of our certificate No. FM27242 is: the design and manufacture of laboratory and science equipment to national/international standards and customer specifications: the distribution of laboratory glassware, plasticware and science equipment.

Further details of certification may be downloaded from our website: www.barloworld-scientific.com

DNA Codons

First Position	T	C	A	G	Third Position
T	TTT Phe (F)	TCT Ser (S)	TAT Tyr (Y)	TGT Cys (C)	**T**
	TTC Phe (F)	TCC Ser (S)	TAC Tyr (Y)	TGC Cys (C)	**C**
	TTA Leu (L)	TCA Ser (S)	TAA *Ter* (stop)	TGA *Ter* (stop)	**A**
	TTG Leu (L)	TCG Ser (S)	TAG *Ter* (stop)	TGG Trp (W)	**G**
C	CTT Leu (L)	CCT Pro (P)	CAT His (H)	CGT Arg (R)	**T**
	CTC Leu (L)	CCC Pro (P)	CAC His (H)	CGC Arg (R)	**C**
	CTA Leu (L)	CCA Pro (P)	CAA Gln (Q)	CGA Arg (R)	**A**
	CTG Leu (L)	CCG Pro (P)	CAG Gln (Q)	CGG Arg (R)	**G**
A	ATT Ile (I)	ACT Thr (T)	AAT Asn (N)	AGT Ser (S)	**T**
	ATC Ile (I)	ACC Thr (T)	AAC Asn (N)	AGC Ser (S)	**C**
	ATA Ile (I)	ACA Thr (T)	AAA Lys (K)	AGA Arg (R)	**A**
	ATG Met (M)	ACG Thr (T)	AAG Lys (K)	AGG Arg (R)	**G**
G	GTT Val (V)	GCT Ala (A)	GAT Asp (D)	GGT Gly (G)	**T**
	GTC Val (V)	GCC Ala (A)	GAC Asp (D)	GGC Gly (G)	**C**
	GTA Val (V)	GCA Ala (A)	GAA Glu (E)	GGA Gly (G)	**A**
	GTG Val (V)	GCG Ala (A)	GAG Glu (E)	GGG Gly (G)	**G**

IUB Coding for 2 possible bases		IUB Coding for 3 possible bases		IUB Coding for 4 possible bases	
M	A and C	V	A and G and C	N	A and T and G and C
R	A and G	H	A and C and T		
W	A and T	D	A and G and T		
S	G and C	B	G and T and C		
Y	C and T				
K	G and T				

Spectrophotometric Quantitation of Nucleic Acids

Spectrophotomeric Conversions: A260 = 1 (1cm detection path)	Concentration (µg/ml water)
dsDNA	50
ssDNA	33
ssRNA	40
Oligonucleotide	20 - 30

Pure DNA has an A_{260}/A_{280} ratio of 1.8-2.0 in 10mM Tris-Cl, pH 8.5
Pure RNA has an A_{260}/A_{280} ratio of 1.9-2.1 in 10mM Tris-Cl, pH 7.5

Electrophoretic Analysis of DNA Fragments

% Agarose	Optimal Size of Fragments (bp)
0.5	1,000 - 30,000
0.7	800 - 12,000
1.0	500 – 10,000
1.2	400 – 7,000
1.5	200 – 3,000
2.0	50 – 2,000

Thermal Cycling

The Polymerase Chain Reaction (PCR)*, is an extremely sensitive technique for amplifying minute amounts of DNA and is used in nearly all molecular biology labs today. PCR is based on the DNA polymerisation reaction and involves the copying of DNA from a specific template using a thermostable DNA polymerase, two primers and deoxynucleotide triphosphates (dNTPs). Primers are short pieces of DNA complementary to the sequence on the DNA strand to be amplified and are used to begin the process of copying a strand of DNA. Extension always begins at the 3' end of the primer with Taq DNA polymerase synthesising exclusively in the 5' to 3' direction.

One PCR cycle consists of the following steps:

1. Denaturation:

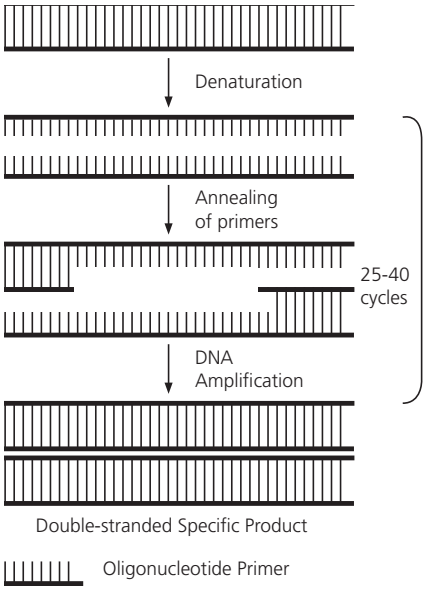
Temperatures higher than 92°C are required to separate double-stranded DNA (dsDNA) into single strands. The hydrogen bonds linking the two strands together are routinely weak and break at lower temperatures than the covalent bonds of the individual strands. 95°C for 30 seconds is the standard incubation. For complex templates such as genomic DNA an additional denaturation step of 5-10 minutes is beneficial prior to the cycling.

2. Annealing:

The two primers bind, one for each of the complementary single DNA strands produced during denaturation. Annealing usually takes place between 40°C and 65°C for ~20 seconds, depending on the length and base sequence of the primers. The annealing temperature is estimated from the primer's melting temperature (temperature at which 50% of the dsDNA is "unzipped") minus 5°C. For low concentrations and long primers, extend the time required for annealing.

3. Extension:

Once the primers anneal to the complementary DNA sequences, the temperature is raised to approximately 72°C and the enzyme *Taq* DNA polymerase replicates the strands. Approximately 60 bases are synthesised per second under optimal conditions, so a 2kb fragment requires ~ 60 seconds for extension.



Schematic Diagram of PCR Reaction

Number of Cycles

At the end of the first cycle there are two new DNA strands, identical to the original target. Every cycle results in a doubling of the number of specific DNA strands. 25-40 cycles are carried out, depending on the number of template molecules in the sample at the start. More than 40 cycles should be avoided as this can lead to the formation of non-specific products. For rare templates nested PCR should be performed using 20-30 cycles with the first set of primers and a further 20-40 cycles with an additional set which bind between the first set of primers.

Buffer

Specially optimised buffer is usually supplied with the enzyme. The 10x buffer normally contains 500mM KCl, 100mM Tris-HCl, pH 8.3 (at 25°C) or 150-200mM $(NH_4)_2SO_4$ with 500-750mM Tris-HCl, pH 9 (at 25°C), 1-2% Triton® X-100 or 0.1% Tween® and 10-15mM Mg^{2+} (usually available separately).

dNTPs

dNTPs are the nucleotides that make up DNA: adenine, guanine, cytosine and thymine and are usually known by their first letter i.e. A, T, C and G. dNTPs are used at a final concentration of 20-200 µM in a reaction. It is important to note that all nucleotides must be at the same concentration. Mispriming and mis-incorporation of bases occurs if the concentration is too high. If modified nucleotides are used they must be at a higher relative concentration than the unmodified bases due to a lower efficiency of incorporation.

*Polymerse Chain Reaction (PCR) is a process covered by the patents owned by Hoffmann-La Roche.

Primers

Typically, primers are 15-30 bases long, and are designed to bind to a unique DNA region on the strand. If the primer is not specific, numerous templates are amplified and "ghost" bands appear on the agarose gel. The upstream primer and the downstream primer are designed to have similar melting temperatures. This is based on the number of A and T nucleotides versus G and C nucleotides. A and T are paired by two hydrogen bonds, whereas there are three linking G and C, thus requiring more energy to separate the strands. Primers should not bind to themselves or the other primer as these result in primer dimers which appear as low molecular weight bands. Today, primers are designed using computer programs to optimise features such as GC content and melting temperatures.

Magnesium

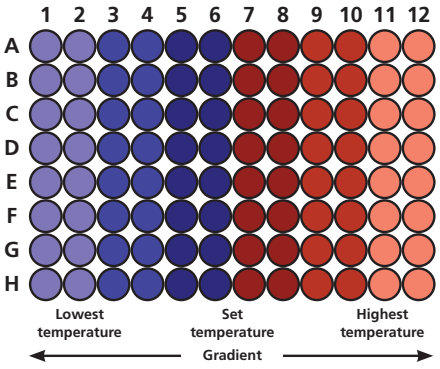
Magnesium is a co-factor for DNA polymerases and the amount required (0.5 - 3.5mM) is template specific. If the concentration is too high non-specific fragments are amplified, too low and the annealing efficiency and synthesis rate of *Taq* DNA polymerase is reduced.

DNA Polymerase

Taq DNA polymerase is an enzyme from the organism *Thermus aquaticus*, and unlike normal polymerase enzymes it is active at high temperatures. 1 unit of *Taq* is normally required for a 50 µl PCR reaction. If the concentration is too high reduced specificity results and if too low, reduced efficiency.

There are many variations on the standard *Taq* DNA polymerase:

- Proofreading enzymes check the newly synthesised DNA with a 3'-5' exonuclease activity. Enzymes such as *Pfu*, which possess this activity, reduce the error rate of 1 in 10^5 bases when *Taq* is used *to* that approaching 1 in 10^8 bases. Proofreading is normally used during cloning of genes to ensure that no errors are introduced into the sequence.
- PCR beads and "ready-to-go" master mixes contain all the reaction components, only template and primers need to be added, thus simplifying reaction set-up.
- Hot start *Taq* is only activated during the first denaturation step, so preventing extension from any non-specific priming that may have occurred during PCR set-up.



Schematic of a 96-well gradient block

Trouble-Shooting

The single most important factor is the annealing temperature. Development of gradient thermal cyclers has solved this time-consuming optimisation and reduced the amount of time, reagents and template required. A gradient of temperatures is set across the block around the predicted annealing temperature. The set temperature is the temperature required in the middle columns of the block and the gradient is the variation at the two extremes of the block; the left hand columns being the coolest and the right hand columns the hottest.

Contamination of the reaction is probably the second most common problem. As the PCR is extremely sensitive it is easy to introduce non-specific contamination into the reaction at any stage. The following guidelines should help to eliminate errors:

- Use RNase, DNase-free reagents and disposables
- Use filter or positive displacement tips
- Perform PCR set-up and analysis in separate areas
- Change gloves regularly
- Use master mixes to set up reactions
- Use positive and negative controls wherever possible

Solvent Evaporation Temperatures

IUPAC Name	Common Name	Boiling point (°C) at 1013 mbar pressure	Pressure (mbar) at which b.p is 40°C
2-propanone	Acetone	56	556
1-pentanol	Pentyl alcohol	137	11
Benzene	Benzene	80	236
1-butanol	Butyl alcohol	118	25
2-methyl-2-propanol	Tert-butyl alcohol	83	130
Chlorobenzene	Chlorobenzene	132	36
Chloroform	Trichloromethane	61	474
Cyclohexane	Cyclohexane	81	235
Ethoxyethane	Diethyl ether	35	Atmospheric
1,2-dichloroethane	Ethylene chloride	83	210
1,2-dichloroethene	Cis-acetylene dichloride	60	479
1,2-dichloroethene	Trans-acetylene dichloride	48	751
2-propan-2-yloxypropane	Isopropyl ether	68	375
1,4-Dioxane	Diethylene oxide	101	107
N,N-dimethylformamide	Dimethylformamide (DMF)	153	11
Acetic acid	Ethanoic acid	118	44
Ethanol	Alcohol	79	175
Ethyl acetate	Ethyl ester	77	40
Heptane	Dipropylmethane	98	120
Hexane	n-hexane	69	335
Propan-2-ol	Isopropanol	82	137
3-methyl-1-butanol	Isoamyl alcohol	130	14
Butan-2-one	Methylethylketone (MEK)	80	243
Methanol	Methyl alcohol	65	337
Dichloromethane	Methylene chloride	40	Atmospheric
Pentane	Pentane	36	Atmospheric
Propan-1-ol	Propyl alcohol	97	67
1,1,1,2,2-pentachloroethane	Pentachloroethane	162	13
1,1,2,2-tetrachloroethane	Tetrachloroethane	138	35
1,1,1 -trichloroethane	Trichloroethane	75	271
Tetrachloromethane	Carbon tetrachloride	76	300
1,1,2,2-tetrachloroethene	Tetrachloroethylene	121	53
Oxolane	Tetrahydrofuran (THF)	67	357
Toluene	Methylbenzene	111	77
1,1,2-trichloroethene	Trichloroethylene	87	183
Oxidane	Water	100	72
Dimethylbenzene	Xylene (mixed)	137	25
1,2-dimethylbenzene	o-xylene	144	34
1,3-dimethylbenzene	m-xylene	139	25
1,4-dimethylbenzene	p-xylene	138	31

SI Base Units

Quantity	Name of Base Unit	Unit Symbol
Length	metre	m
Mass	kilogram	kg
Time	second	s
Electric current	ampere	A
Thermodynamic temperature	kelvin	K
Amount of substance	mole	mol
Luminous intensity	candela	cd

SI Derived Units

Quantity units	Unit Name	Unit Symbol	Expression in terms of SI base
Force	Newton	N	$m\ kg\ s^{-2}$
Energy	joule	J	$m^2\ kg\ s^{-2}$
Power	watt	W	$m^2\ kg\ s^{-3}$
Pressure, stress	pascal	Pa	$m^{-1}\ kg\ s^{-2}$
Electric potential	volt	V	$m^2\ kg\ s^{-3}\ A^{-1}$
Electric charge	coulomb	C	s A
Electric flux	coulomb	C	s A
Magnetic flux	weber	Wb	$m^2\ kg\ s^{-2}\ A^{-1}$
Magnetic flux density	tesla	T	$kg\ s^{-2}\ A^{-1}$
Electric resistance	ohm	Ω	$m^2\ kg\ s^{-3}\ A^2$
Capacitance	farad	F	$m^{-2}\ kg^{-1}\ s^4\ A^2$
Inductance	henry	H	$m^2\ kg\ s^{-2}\ A^{-2}$
Celsius temperature	degree Celsius	°C	K
Frequency	hertz	Hz	s^{-1}
Luminous flux	lumen	lm	cd sr
Illuminance	lux	lx	m^{-2} cd sr
Activity (of a radionuclide)	Becquerel	Bq	s^{-1}
Absorbed dose	gray	Gy	$m^2\ s^{-2}$
Dose equivalent	sievert	Sv	$m^2\ s^{-2}$
Torque	newton metre	N m	$m^2\ kg\ s^{-2}$
Electric field strength	volt per metre	V/m	$m\ kg\ s^{-3}\ A^{-1}$
Magnetic field strength	ampere per metre	A/m	m^{-1} A
Thermal conductivity	watt per metre kelvin	$W\ m^{-1}\ k^{-1}$	$m\ kg\ s^{-3}\ K^{-1}$
Luminance	candela per square metre	cd/m^2	m^{-2} cd

Physical Constants

Constant	Symbol	Value	Unit
Atomic mass unit	m_u	$1.660540 \cdot 10^{-27}$	kg
Avogadro constant	N_A	$6.022137 \cdot 10^{23}$	mol^{-1}
Bohr magneton	μ_B	$9.274015 \cdot 10^{-24}$	JT^{-1}
Bohr radius	a_o	$5.291771 \cdot 10^{-11}$	m
Boltzmann constant	k_B	$1.380662 \cdot 10^{-23}$	JK^{-1}
Compton wavelength (e)	λ_{Ce}	$2.426311 \cdot 10^{-12}$	m
Compton wavelength (n)	λ_{Cn}	$1.319591 \cdot 10^{-15}$	m
Compton wavelength (p)	λ_{Cp}	$1.321410 \cdot 10^{-15}$	m
Electric field constant in vacuo	ε_o	$8.854188 \cdot 10^{-12}$	Fm^{-1}
Electron radius	r_e	$2.817941 \cdot 10^{-15}$	m
Elementary charge	e	$1.602177 \cdot 10^{-19}$	C
Faraday constant	F	$9.648531 \cdot 10^{4}$	$Cmol^{-1}$
Fine structure constant	α	$7.297353 \cdot 10^{-3}$	
Gas constant	R	8.31451	$J\ mol^{-1}K^{-1}$
Gravitation constant	f	$6.672590 \cdot 10^{-11}$	$Nm^{-2}kg^{-2}$
Intrinsic impedance	r	$3.767301 \cdot 10^{2}$	Ω
Light velocity in vacuo	c	$2.997924 \cdot 10^{8}$	ms^{-1}
Loschmidt constant	N_L	$2.686763 \cdot 10^{25}$	m^{-3}
Magnetic field constant in vacuo	μ_0	$1.256637 \cdot 10^{-7}$	Hm^{-1}
Molar volume of ideal gases 298K, 101.325kPa	υ	$2.445294 \cdot 10^{-2}$	m^3mol^{-1}
Normal acceleration of fall	g	9.80665	ms^{-2}
Planck constant	h	$6.626075 \cdot 10^{-34}$	Js
Rest mass of the electron	m_e	$9.109390 \cdot 10^{-31}$	kg
Rest mass of the neutron	m_n	$1.674929 \cdot 10^{-27}$	kg
Rest mass of the proton	m_p	$1.672623 \cdot 10^{-27}$	kg
Rational quantum	$h/(2\pi)$	$1.054588 \cdot 10^{-34}$	Js
Rydberg constant	R_∞	$1.097373 \cdot 10^{7}$	m^{-1}

Thermal Cyclers

Product Code	Description	Voltage	Shipping Weight (kg)
TC-3000			
FTC3/02	Thermal cycler TC3000, 25 x 0.2ml capacity	230V/120V	8
FTC3/05	Thermal cycler TC3000, 20 x 0.5ml capacity	230V/120V	8
FTC3/02Y	Thermal cycler TC3000, 25 x 0.2ml capacity	100V	8
FTC3/05Y	Thermal cycler TC3000, 20 x 0.5ml capacity	100V	8
TC-3000 Accessory Blocks			
FTC3/02/B	Block, 25 x 0.2ml microtubes		1.16
FTC3/05/B	Block, 20 x 0.5ml microtubes		1.30
TC-412			
FTC41S5D	TC-412 for 60 x 0.5ml microtubes	230/115V	13
FTC41S5Y	TC-412 for 60 x 0.5ml microtubes	100V	13
FTC41H2D	TC-412 for 96 x 0.2ml microtubes or 96-well plate	230/115V	13
FTC41H2Y	TC-412 for 96 x 0.2ml microtubes or 96-well plate	100V	13
FTC41F2D	TC-412 for 96 x 0.2ml microtubes or 96-well fully skirted plate	230/115V	13
FTC41F2Y	TC-412 for 96 x 0.2ml microtubes or 96-well fully skirted plate	100V	13
FTC4384D	TC-412 for 384-well microtitre plate	230/115V	13
FTC4384Y	TC-412 for 384-well microtitre plate	100V	13
FTC41FLD	TC-412 flat plate for *In-situ* (holds 4 slides)	230/115V	13
FTC41FLY	TC-412 flat plate for *In-situ* (holds 4 slides)	100V	13
TC-412 Quad			
FTC4QH2D	4 x TC-412 for 96 x 0.2ml microtubes or 96-well plate	230/115V	53
FTC4QH2Y	4 x TC-412 for 96 x 0.2ml microtubes or 96-well plate	100V	53
FTC4QF2D	4 x TC-412 for 96 x 0.2ml microtubes or 96-well fully skirted plate	230/115V	53
FTC4QF2Y	4 x TC-412 for 96 x 0.2ml microtubes or 96-well fully skirted plate	100V	53
FTC4Q38D	4 x TC-412 384-well microtitre plate	230/115V	53
FTC4Q38Y	4 x TC-412 384-well microtitre plate	100V	53
TC-412 & TC-412 Quad Interchangeable Blocks			
FTC41B5D	Block for 60 x 0.5ml microtubes	-	2
FTC41BHD	Block for 96 x 0.2ml microtubes or 96-well plate	-	2
FTC41BFD	Block for 96 x 0.2ml microtubes or 96-well plate fully skirted plate	-	2
FTC4B384	Block for 384-well microtitre plate	-	8.4
FTC41BID	Flat plate block for *In-situ* (holds 4 slides)	-	1.9
TC-512			
FTC51S5D	TC-512 for 60 x 0.5ml microtubes	230/115V	14
FTC51S5Y	TC-512 for 60 x 0.5ml microtubes	100V	14
FTC51H2D	TC-512 for 96 x 0.2ml microtubes or 96-well plate	230/115V	14
FTC51H2Y	TC-512 for 96 x 0.2ml microtubes or 96-well plate	100V	14
FTC51F2D	TC-512 for 96 x 0.2ml microtubes or 96-well fully skirted plate	230/115V	14
FTC51F2Y	TC-512 for 96 x 0.2ml microtubes or 96-well fully skirted plate	100V	14
FTC5384D	TC-512 for 384-well microtitre plate	230/115V	14
FTC5384Y	TC-512 for 384-well microtitre plate	100V	14
FTC51FLD	TC-512 flat plate for *In-situ* (non-gradient) (holds 4 slides)	230/115V	14
FTC51FLY	TC-512 flat plate for *In-situ* (non-gradient) (holds 4 slides)	100V	14
TC-512 Interchangeable Blocks			
FTC51B5D	Block for 60 x 0.5ml microtubes		
FTC51BHD	Block for 96 x 0.2ml microtubes or 96-well plate		
FTC51BFD	Block for 96 x 0.2ml microtubes or 96-well fully skirted plate		
FTC5B384	Block for 384-well microtitre plate		
FTC51BID	Flat plate block for *In-situ*, non gradient (holds 4 slides)		

Thermal Cyclers

Product Code	Description	Pack Quantity
FTUB02TW	0.2ml thin-walled microtubes	Pack of 1000 with cap
FTUB05TW	0.5ml thin-walled microtubes	Pack of 1000 with cap
FMITUBC	0.2ml thin-walled 8 strip microtubes	Pack of 125 strips of 8
FMICAPC	0.2ml 8-strip microtube caps	Pack of 125 strips of 8
FSTRIP1	Strips of 8 low-profile tubes (clear)	10 packs of 12 strips
FSTRIP2	Strips of 0.2ml tubes which can be used with domed or flat cap strips (available separately)	Pack of 125 strips
FSTRIP3	Strips of 0.2ml tubes with each tube having an individual flat cap	Pack of 120 strips
FSTRIP4	Strips of 0.2ml tubes with attached, hinged strip of 8 domed caps	Pack of 125 strips
F8CAP1	Strips of 8 flat ultra clear caps	Pack of 120 strips of 8
F8CAP2	Strips of 8 domed caps for use with FSTRIP2	Pack of 125 strips
F8CAP3	Strips of 8 flat caps for use with FSTRIP2	Pack of 125 strips
F96T02	96-well plate, flat top, non-skirted (clear)	Pack of 25 plates
F96PLHS	96-well plate, half skirt (clear)	Pack of 25 plates
F96PLNS	96-well plate raised top, non-skirted (clear)	Pack of 25 plates
FMIP384	384-well plate (clear)	Pack of 50 plates
FHSEALSD	Heat sealer (plate adaptor not supplied), 230V	
FHSEALSP	Heat sealer (plate adaptor not supplied),120V	
FHSEALSY	Heat sealer (plate adaptor not supplied),100V	
F96SEAL	96-well sealing mat (silicone)	Pack of 50 mats
FHSPA96	Heat sealer plate adaptor for 96-well format	
FHSPA384	Heat sealer plate adaptor for 384-well format	
FHSEAL	Heat seal foil	Pack of 100 sheets
FHSFILM	Optical heat sealing film	Pack of 100 sheets
FCOOL	Mini cooler. Suitable for all 0.2ml tubes, strip tubes and 96-well plates	
FTGSM1	(TC-512 only) Smart card, 5V, please check your cycler for correct card type	
FTGSM2	(TC-512 only) Smart card, 3V, please check your cycler for correct card type	

TC-3000, TC-412 and TC-512 PC Connections

To connect ANY single thermal cycler to a PC:

FGEN232	RS232 cable and Gensoft software

To connect TC-3000 and/or TC-412s to a PC, a single powerpack and a cable set for the required number of cyclers is required. The power pack includes the PC connector, power pack, terminator box and cable to connect the PC to the first cycler.

FGEN485D	230V Power pack UK and Gensoft software
FGEN485E	230V Power pack EU and Gensoft software
FGEN485P	115V/110V Power pack US and Gensoft software
FGENFOUR	Four cycler cable set (4 connectors + 3 cables)
FGENTEN	Ten cycler cable set (10 connectors + 9 cables)
FGENONE	One cycler cable extension set (1 connector + 1 cable)

If a TC-512 is also being connected the power pack is NOT required and the TC-512 PC connection option should be followed

FTGEN485	PC 485 converter and cable
6103557	Single cycler cable for connecting 2 TC-512s together

Hybridisation Incubators

Hybrigene HB-3D incubator

Product Code	Model	Voltage	Hz	Watts	Shipping Weight (kg)
FHB4DD	Hybrigene HB-3D hybridisation incubator	230V	50/60	750	21
FHB4DP	Hybrigene HB-3D hybridisation incubator	120V	50/60	750	21
FHB4DY	Hybrigene HB-3D hybridisation incubator	100V	50/60	525	21
FHB4DSTK	Hybrigene HB-3D incubator stacking kit (secures 2 units together)				
FHB4WALL	Hybrigene HB-3D incubator wall fixing kit (for securing 1-3 units to the wall)				
FHB4DKIT	Complete kit for stacking 3 Hybrigenes (stacking and wall fixing kits)				
Hybridiser HB-1D					
FHB1DE	Hybridiser HB-1D hybridisation incubator	230V	50/60	750	24
FHB1DQ	Hybridiser HB-1D hybridisation incubator	120V	50/60	750	24
FHB1DK	Hybridiser HB-1D hybridisation incubator	100V	50/60	750	24
Accessories (excluding tubes)					
FHTRACK	HTH-1 tube rack, holds 3 large and 3 small glass tubes				
FMEM2020	Membrane separators 200 x 200mm (pack of 5)				
FHB4/PLAT	Hybrigene HB-3D rocking platform (30-120 oscillations/minute)				
FHB1/PLAT	Hybridiser HB-1D rocking platform (30-120 oscillations/minute)				
FHB4SH1	Hybrigene HB-3D stainless steel mesh shelf				
FHBSH1	Hybridiser HB-1D stainless steel mesh shelf				

Hybridisation tubes and carriers

Tube types	Product Code	Size (mm) Diam. x L	Priced Capacity	Total Capacity	Description
Hybrigene HB-3D					
Large glass tube	FHB16*	80 x 240	single	4	Glass tube with push on end caps
Small glass tube	FHB36	44 x 240	single	4	Glass tube with screw-on end cap, tube has end plug
Mini glass tube assembly	FHB41 FHB61	32 x 205 tube carrier	pack of 4 single	4 x 4	Glass tubes with screw-on end cap, requires FHB61 Carrier for tubes FHB41
Small glass tube assembly	FHB71 FHB70 FHB72	44 x 220 tube carrier assembly	single single complete	4 x 3 4 x 3	Glass tube with screw-on end cap, without end plug. Requires FHB70 Carrier for tubes FHB71 Complete with carrier (FBH70) and 3 small tubes (FHB71)
15ml tube holder	F15ML4TH	tube carrier	single	4 x 16	Carrier with clips to hold 16 x 15 ml tubes (approx. diameter 16.5mm)
50ml tube holder	F50ML4TH	tube carrier	single	4 x 8	Carrier with clips to hold 8 x 50ml tubes (approx. diameter 29mm)
Hybridiser HB-1D					
Large glass tube	FHB12*	80 x 200	single	6	Glass tube with push on end caps
Small glass tube	FHB32	44 x 200	single	6	Glass tube with screw-on end cap, tube has end plug
Mini glass tube assemblies	FHB41 FHB43	32 x 205 tube carrier	pack of 4 single	6 x 4	Glass tubes with screw-on end cap, requires FHB43 Carrier for tubes FHB41
15ml tube holder	F15ML1TH	tube carrier	single	6 x 16	Carrier with clips to hold 16 x 15 ml tubes (approx diameter 16.5mm)
50ml tube holder	F50ML1TH	tube carrier	single	4 x 8	Carrier with clips to hold 8 x 50ml tubes (approx diameter 29mm)

*Sealing rings supplied with these parts are suitable only for operation up to 70°C. For operation up to 100°C, part number 6101488 x 2 should be ordered.

Dri-Block® Heaters

Model	Product Code	Voltage	Hz	Watts	Shipping weight (kg)
DB-2A	FDB02AD	230V	50/60Hz	300	4
DB-2A	FDB02AP	115V	50/60Hz	300	4
DB-2D	FDB02DD	230V	50/60Hz	300	5
DB-2D	FDB02DP	115V	50/60Hz	300	5
DB-2D + RS232	FDB02DDR	230V	50/60Hz	300	5
DB-2D + RS232	FDB02DPR	115V	50/60Hz	300	5
DB-2TC	FDB02DDTC	230V	50/60Hz	300	5
DB-2TC	FDB02DPTC	110/120V	50/60Hz	300	5
DB-2TC	FDB02DYTC	100V	50/60Hz	300	5
DB-3	FDB03OD	230V	50/60Hz	450	6
DB-3	FDB03OP	115V	50/60Hz	450	6
DB-3A	FDB03AD	230V	50/60Hz	450	6
DB-3A	FDB03AP	115V	50/60Hz	450	6
DB-3D	FDB03DD	230V	50/60Hz	450	6
DB-3D	FDB03DP	115V	50/60Hz	450	6
DB-3D + RS232	FDB03DDR	230V	50/60Hz	450	6
DB-3D + RS232	FDB03DPR	115V	50/60Hz	450	6
DB-4D	FDB04DD	230V	50/60Hz	600	7
DB-4D	FDB04DP	115V	50/60Hz	600	7
DB-4D + RS232	FDB04DDR	230V	50/60Hz	600	7
DB-4D + RS232	FDB04DPR	115V	50/60Hz	600	7

Dri-Block® Accessories

Product Code	Description
FDBSOFT	DBsoft software for DB-2D/3D/4D

Aluminium Insert Blocks

Product Code	Tube Size	No. of Holes	Diameter (mm)	Hole Depth (mm)
F3501	Plain block	None	-	-
F3502	6mm	6x5 array	6.5	38
F3503	10mm	5x4 array	10.75	48
F3504	12mm	5x4 array	12.75	48
F3505	13mm	5x4 array	13.8	48
F3506	15mm	4x3 array	15.75	48
F3507	16mm	4x3 array	16.75	48
F3508	19mm	3x1 2x1 3x1 array	19.75	48
F3509	25mm	3x2 array	25.75	48
F3510	10mm cuvette	2 channels	13	38
F4460	Plain block	Thermometer hole		
F4461	9mm/7mm	10/20 6x5 odd array	9.5/7.0	38
F4462	24mm	3x2 array	24.75	48
F4463	26mm	3x2 array	26.75	48
F4464	1.5ml microtube	5x4 array	10.9	35
F4465	0.5ml microtube	6x5 array	7.9	26.5
F4466	Plastic half block	Plain	-	-
F4470	2ml microtube	5x4 array	10.8	35
F4471	0.2ml	9x8 array	7.0	13.8

Sample Concentrator

Sample Concentrator

Product Code	Description	Shipping Weight (kg)
FSC400D	Sample Concentrator gas chamber and stand only	5
FSC496D	Sample Concentrator gas chamber and stand only (96-well)	5

Needles for Sample Concentrator

F7209	Pack of 100 needles, 76mm long
F7210	Pack of 100 needles, 127mm long
FSC4NCS	Pack of 100 PTFE coated needles, 76mm long
FSC4NCL	Pack of 100 PTFE coated needles, 127mm long

NOTE: The Dri-Block® aluminium insert blocks and needles are not included with the Sample Concentrator and must be ordered separately. Each of the DB-3 series Dri-Block® heaters for use with the Sample Concentrator will take three insert blocks.

Gelation Timer

Product Code	Description	Watts	Dimension H x W x D (mm)	Shipping weight (kg)
FGT5	GT-5 digital gelation timer, 1rpm	5	119 x 69 x 94	7.7
FGT6	GT-6 digital gelation timer, 10rpm	5	119 x 69 x 94	7.7

Gelation Timer Accessories

F0985	Plunger, 22mm	
F0979	Plunger, 19mm	
F0982	Plunger, 16mm	
F1794	Pack of 100 disposable plungers	1
F1795	Glass plunger adaptor	
F7846	Pack of 240 sample cups	4

Water Baths and Thermoregulators

Thermoregulators (supplied without bath)

Model	Product Code	Voltage	Hz	Watts	Shipping Weight (kg)
TE-10A	FTE10ADC	230 UK/EU	50/60	1000	3.7
TE-10A	FTE10APC	115 US	50/60	1000	3.7
TE-10A	FTE10AYC	100 Japan	50/60	850	3.7
TE-10D	FTE10DDC	230 UK/EU	50/60	1000	3.9
TE-10D	FTE10DPC	115 US	50/60	1000	3.9
TE-10D	FTE10DYC	100 Japan	50/60	850	3.9
TU-20D	FTU20DDC	230 UK/EU	50/60	1800	4.0
TU-20D	FTU20DPC	115 US	50/60	1500	4.0
TU-20HT	FTU20HDC	230 UK/EU	50/60	1800	4.0
TU-20HT	FTU20HPC	120 US	50/60	1500	4.0
TU-20HT	FTU20HYC	100 Japan	50/60	1250	4.0

Unheated Baths (supplied with bridge mounting plate)

Model	Product Code	Voltage	Hz	Watts	Shipping Weight (kg)
B-8	FBATH08	–	–	–	5.5
B-12	FBATH12	–	–	–	6.1
B-18	FBATH18	–	–	–	7.5
B-26	FBATH26	–	–	–	9.5
B-48	FBATH48	–	–	–	14.6

Refrigerated Baths (supplied with lid)

Model	Product Code	Voltage	Hz	Watts	Shipping Weight without controller (kg)
RB-5A	FRB5	-	50/60	320	31
RB-12A	FRB2	-	50/60	760	53
RB-22A	FRB22	-	50/60	760	61

LCB Series Baths (supplied with lid and cover)

Model	Product Code	Voltage	Hz	Watts	Shipping Weight (kg)
LCB-5	FBCAL05D	–	–	–	5
LCB-7	FBCAL07D	–	–	–	6
LCB-12	FBCAL12D	–	–	–	9

Liquid Baths Accessories

Bath Size	Flat Lids	Gabled Lids	Adjustable Trays
8 litres	FFLAT08	FGABLE08	FADJ08
12 litres	FFLAT12	FGABLE12	FADJ12
18 litres	FFLAT18	FGABLE18	FADJ18
26 litres	FFLAT18	FGABLE18	FADJ26
48 litres	FFLAT48	FGABLE48	FADJ48
Cooling Coil	FCC01		
Thermometer -50-50°C	F6754		
Thermometer 0-100°C	F6755		
Thermometer 30-220°C	F6756		
Bridge mounting plate (8-26 litre)	FBRIDGE1		
Bridge mounting plate (48 litre only)	FBRIDGE2		
Polypropylene spheres, 250 x 25mm diameter	F840D		
FTUSOFT	Thermsoft software diskette only		
FTU232	Thermsoft software diskette and RS232 cable		
FCP1D	Refrigeration control pack, 120/230V (can be supplied fitted to refrigeration unit)		
FCP2D	Cooling water control pack, 230V		
FCP2P	Cooling water control pack, 120V		

Dip and Flow Coolers

Model	Product Code	Voltage	Hz	Watts	Shipping Weight (kg)
RU-200	FRU2D	230 UK	50/60	320	19
RU-200	FRU2E	230 EU	50/60	320	19
RU-200	FRU2P	115 US	50/60	320	19
FC-200	FFC2D	230 UK	50/60	320	19
FC-200	FFC2E	230 EU	50/60	320	19
FC-200	FFC2P	115 US	50/60	320	19
RU-500	FRU5D	230 UK	50/60	760	39
RU-500	FRU5E	230 EU	50/60	760	39
RU-500	FRU5P	115 US	50/60	760	39
FC-500	FFC5D	230 UK	50/60	760	39
FC-500	FFC5E	230 EU	50/60	760	39
FC-500	FFC5P	115 US	50/60	760	39

Biological Stirrer Units

Model	Product Code	Voltage	Hz	Watts	Shipping Weight (kg)
MCS-101L	FMCS101L	230/115	50/60	2	7.5
MCS-102L	FMCS102L	230/115	50/60	2	4.2
MCS-104S	FMCS104S	230/115	50/60	2	5.3
MCS-104L	FMCS104L	230/115	50/60	2	7.1
MCS-104XL	FMCS104X	230/115	50/60	2	13.5

Cell Culture Vessels (complete)

Product Code	Flask Size
F7988	125 ml
F7689	250 ml
F7607	500 ml
F7608	1 litre
FA298	3 litre
FA296	5 litre (5 neck)
FA709	5 litre (2 neck)

Culture Flasks (Glassware only – No end caps or seals

Product Code	Flask Size
F7987	125 ml
F7690	250 ml
F7609	500 ml
F7610	1 litre
FA299	3 litre
FA297	5 litre (5 neck)
FA710	5 litre (2 neck)
6007989	Stirrer rod assembly 125ml
6007635	Stirrer rod assembly 250ml
6007619	Stirrer rod assembly 500ml
6007620	Stirrer rod assembly 1 litre
6100290	Stirrer rod assembly 3 litre
6100289	Stirrer rod assembly 5 litre

TECHNE

Barloworld Scientific Limited. Beacon Road, Stone, Staffordshire ST15 0SA
United Kingdom Tel: +44 (0)1785 812121 Fax: +44 (0)1785 813748
equipment@barloworld-scientific.com www.barloworld-scientific.com