Grant

Scientific Equipment

Catalogue 2016

Precision temperature control, sample preparation and life-science products for the world's laboratories.

INSTRUMENTAL IN YOUR SUCCESS

Contents

* with accessory cooling
LT ecocool™ 200 available 2016

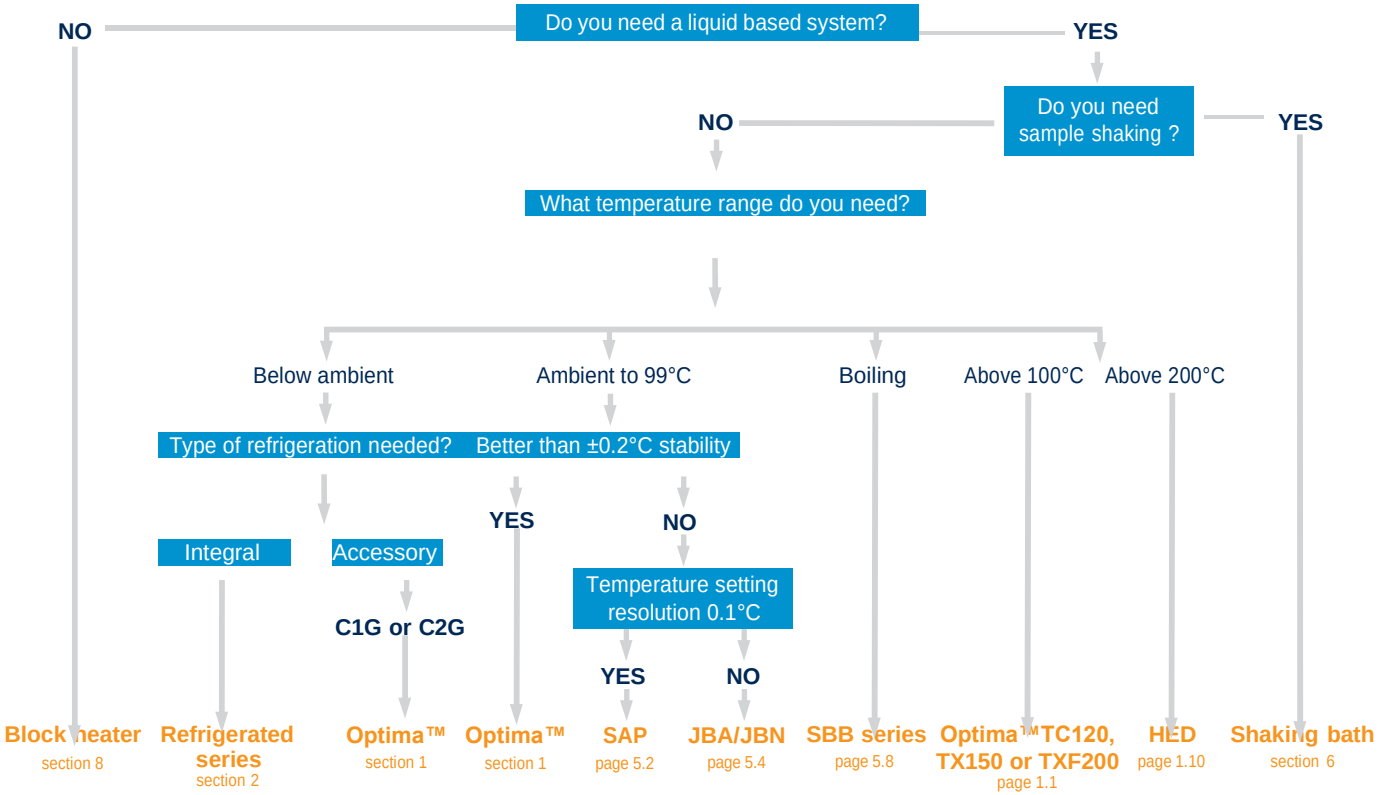
Grant-bio™ life-science products

Application specific products

Other Grant products, capabilities and general information

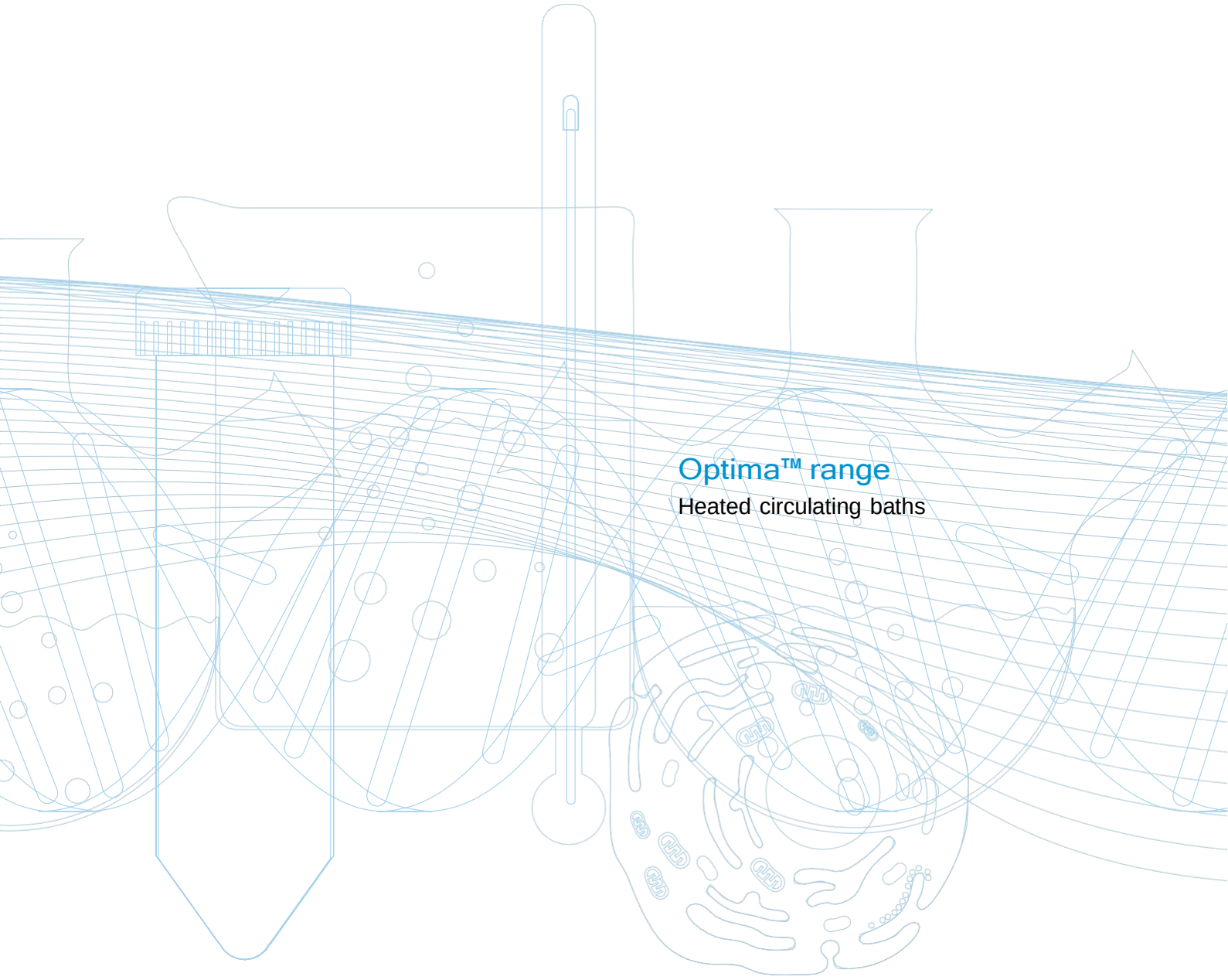
Product selectors

Grant scientific product selector



Grant bio range - how to choose a shaker, rocker, vortex mixer

1 Heated circulating baths



Optima™ range

Heated circulating baths

Optima™ heated circulating baths and circulators

A cost-effective range of multi-purpose systems combining Grant's legendary quality and reliability. Precise temperature control for a wide range of laboratory applications.

- Accurate and safe temperature control – for samples and users
- Intuitive programming and thoughtful design features – makes working with Grant heated circulating baths and circulators easy
- Robust, durable construction – for longevity, reliability and long-term low cost of ownership
- A complete range – 32 models to cover basic through to sophisticated needs, each model represents excellent value for money

3 year warranty

Model selection (operating temperature)

Any of the four Grant Optima™ digital heating circulators can be combined with any of eight Grant tanks (five stainless steel and three plastic) to provide a choice of 32 models. The colour-coded summary table on page 1.6 shows you the temperature range of each combination.

The following pages showcase examples of popular combinations for different requirements.

Liquids

We recommend the following liquids for use in Grant baths:

-50°C to 30°C: Silicone oil - low viscosity (Bayer silicone M3)
-30°C to 30°C: 50% water 50% antifreeze (inhibited ethylene glycol)
0°C to 30°C: 80% water 20% antifreeze (inhibited ethylene glycol)
5°C to 99.9°C: Water
70°C to 150°C: Silicone fluid (viscosity ~20cS, flash point ≥230°C, fire point ≥280°C)
70°C to 200°C: Silicone fluid (viscosity 50cS centistokes, flash point ≥285°C, fire point ≥340°C)

Heating circulators

T100, TC120, TX150, TXF200

The versatile Optima™ heating circulator range consists of 4 models - two general purpose: T100 and TC120 and two advanced models: TX150 and TXF200. Combine any of the four models with a Grant stainless steel or plastic tank or use independently with a clamp.

General purpose digital		Advanced digital	
T100 ambient +5 to 100ºC*	**TC120 ambient +5 to 120ºC***	**TX150 ambient +5 to 150ºC***	**TXF200 ambient +5 to 200ºC***

T100 / TC120		TX150 / TXF200	
Features	**Benefits**	**Features**	**Benefits**
Stability ±0.05°C	Excellent temperature stability and temperature control for demanding applications	Stability ±0.01°C	Excellent temperature stability and temperature control for demanding applications
Clear, bright 4 digit LED display	Easy to view from a distance for instant reassurance of unit status	Large, bright full colour display	All key parameters visible on home screen for instant reassurance of unit status
Simple, intuitive user interface: dial and two function buttons	Easy and quick to set temperature and access menus. Minimal product training required	Icon driven home screen via a dial and two function buttons	Intuitive, quick and easy, language independent
Integral pump for external circulation (TC120)	Circulation of temperature control fluids to external apparatus / equipment	High performance integral pump for external circulation. TXF200 has variable speed	Conveniently circulate temperature control fluids to external apparatus / equipment
Model available with/without clamp (T-clamp)	Conveniently converts vessels into stirred bath, offering excellent versatility	Programming/temperature profiling (TX150, 1 program with 30 segments, TXF200 10 programs with 100 segments)	Easy and quick to configure temperature profiles to suit basic and advanced applications. Programming direct on TXF200
Low-liquid detection (float switch)	Unit will cut-out when liquid level is too low for operation	Model available with/without clamp (T-clamp)	Conveniently converts vessels into stirred bath, offering excellent versatility
User adjustable over temperature dial (TC120)	Independent safety feature and sample protection	Low-liquid detection (float switch)	Unit will cut-out when liquid level is too low for operation. Peace of mind that the unit will safely operate unattended
Fixed over temperature (T100)	Independant safety feature	5 point user calibration	Calibrate the TX150/TXF200 at any 5 temperatures against a precision reference thermometer. Provides optimum accuracy at temperatures important to the user.
Visual alarm	Alerts you when your attention is required	User adjustable over temperature dial	Independent safety feature and sample protection
2 point user calibration	Provides optimum accuracy at temperatures important to the user	Display with a choice of 5 languages (EN, DE, FR, ES & IT)	-
Countdown timer (TC120)	Offers convenient reaction timing	USB/RS232 interface	Allows connection to PC or laptop for programming or data logging

Applications:

- Clinical, Microbiology and Pathology labs - media tempering, thawing & incubating samples
- University research - temperature control of spectrophotometers & refractometers and jacketed vessels
- Industrial labs - temperature probe calibration, water analysis, QC testing product, petrochemical testing, material testing, milk sample testing

Showcase 1 – **mid range** example

Model TC120-ST12* range 0°C to 120°C**, stability ±0.05°C

Versatile mid-range model with digital thermostatic control unit and stainless steel tank and a comprehensive specification to suit most applications for precision temperature control.

- **Optima™ digital thermostat (TC120) for precisetemperature control**
- **Integral pump for external fluid circulation**
- **Cooling/heating range 0°C to 120°C****
- **Stability ±0.05°C**
- **3 programmable temperature presets**
- **Easy to use rotary dial and two function keys**

TC120-ST12 model shown

Countdown timer with audible alarm – alerts you when your attention is required

Simple-to-use rotary dial plus two function keys for quick temperature setting and menu navigation

User calibration facility for optimum accuracy at the required operating temperature

Powerful integral pump – allows temperature-controlled fluid to be circulated to external equipment (16L/min, 210mbar)

Dual-position bridge plate - ensures visibility/accessibility of the thermostat whilst optimising bench space

Raised feet – for carrying / repositioning and retort stand access

Liquid level protection and adjustable over temperature cut-out

Clear 4 digit display – easy to read from a distance for instant reassurance

Operating setpoint plus **3 adjustable temperature presets** for convenience

Robust construction, corrosion resistant materials, stainless steel tank – durable in demanding environments

Excellent temperature stability and uniformity ensured by stirred circulation in the bath

Drain tap allows easy emptying

Choice of **120 V and 230 V models**

Optional insulated gabled, removable hinged lid designed to improve energy efficiency and prevent evaporation

* see summary table on pp. 1.6–1.7 for accessories and for other models utilising the TC120 thermostat
** operation below ambient temperature requires accessory cooling

Applications:

- Clinical, Microbiology and Pathology labs - media tempering, thawing & incubating samples
- University research - temperature control of spectrophotometers & refractometers and jacketed vessels
- Industrial labs - temperature probe calibration, water analysis, QC testing product, petrochemical testing, material testing, milk sample testing

Showcase 2 – **high specification** example

Model TXF200-ST26* range -15°C to 200°C**, stability ±0.01°C

High specification model with high performance digital thermostat and stainless steel tank for sophisticated applications requiring complex programming and/or ultra precise temperature control

- **Optima™ high performance digital thermostat (TXF200) for ultra precise temperature control**
- **Stability ±0.01°C**
- **Cooling/heating range -15°C to 200°C****
- **Full colour screen**
- **Easy to program via interface or remotely via PC / Laptop using Labwise™ software**
- **Key functions easily accessed via home screen icons**

TXF200-ST26 model shown

Full colour screen – clearly displaying actual and set temperatures, pump speed and clear status icons

Intuitive screen icons and menus – allow fast and accurate setup

Socket for optional external probe – allows remote temperature control

Five-point user calibration facility for optimum accuracy

Countdown timer with audible alarm alerts when your attention is required

Drain tap allows easy emptying

Raised feet – for carrying / repositioning and retort stand access.

Memory capacity for 10 programs containing 100 segments

Program via intuitive user interface or connect to PC/laptop to program via Labwise™ software

The programming interface includes set target temperature - a choice of time to target temperature or temperature ramp speed. An additional programmable relay for on/off control of ancillary equipment

High and low temperature alarm settings – visual, audible and programmable

external fluid circulation – variable speed, 22L/min, 530mbar

Optional insulated gabled and removable hinged lid designed to improve energy efficiency and prevent evaporation

Accessory cooling systems allow operation at or below ambient temperature. See page 1.7 for details

* see summary table on p. 1.6–1.7 for accessories and other models utilising the Grant high performance digital control units
** operation below ambient temperature requires accessory cooling

Applications:

- Industrial labs - thermostat calibration, haze analysis (brewing), temperature probe calibration and material testing
- University research - temperature control of external equipment such as spectrophotometers and refractometers. Circulation of temperature control fluid to jacketed vessels

Showcase 3 – **budget** example

Model T100-P12* range ambient +5°C to 99°C, stability ±0.05°C

Economy model with digital thermostatic control unit and plastic tank for straightforward applications requiring accurate temperature control.

- **Optima™ digital thermostat (T100) for accurate temperature control**
- **Cooling/heating range ambient +5°C to 99°C**
- **Stability ±0.05°C**
- **3 programmable temperature presets**
- **Low liquid protection and fixed over temperature cut-out**

T100-P12 model shown

Visual alarm – alerts you when your attention is required

Simple-to-use rotory dial and two function keys for quick temperature setting and menu navigation

Optional removable flat lid to minimise evaporation of fluid and avoid contamination of samples

Choice of **120 V and 230 V models**

User calibration facility for optimum accuracy at the required operating temperature

Low liquid protection and fixed over temperature cut-out

Operating setpoint plus **3 adjustable preset temperatures** for convenience

Wide range of optional accessories for different applications, including test tube racks and raised shelves

Robust plastic construction, double-walled for rigidity, easy to clean

* see summary table on p. 1.6 for accessories and for other models utilising T100 control units and/or plastic tanks

Applications:

- Clinical, Microbiology and Pathology labs - media tempering, thawing & incubating samples
- Teaching labs, higher education/universities - practical demonstration/experimentation, sample preparation

Heating circulating baths - models, options and accessories

Any of the four Grant Optima™ digital thermostats can be combined with any of the Grant stainless steel and plastic tanks. The colour-coded summary table shows you the temperature range of each combination. For more details of Grant Optima™ thermostats see, p 1.8.

Key to symbols

- fixed over temperature cutout
- adjustable over temperature cutout
- display
- audible alarm
- timer
- pump
- external probe
- USB + RS232
- 2 point recalibration
- relay
- visual alarm
- 5 point recalibration
- menu system
- program storage
- programmable

	Heating circulators			
	General purpose digital		Advanced digital	
	T100	TC120	TX150	TXF200
	 2.5 kg h: 335 mm d: 172 mm w: 120 mm	 2.5 kg h: 335 mm d: 172 mm w: 120 mm	 3 kg h: 345 mm d: 172 mm w: 120 mm	 3 kg h: 345 mm d: 172 mm w: 120 mm

Heating circulating baths - models, options and accessories

Capacity (L) Outer tank dimensions	• working area (d x w) • Min/max liquid depths • Inner tank dimensions (h x d x w) • Overall dimensions incl. controller (h x d x w)	2	2 ϖ	ϖ5 5	ϖ5
ST5 - 5L stainless steel  3 kg h: 200 mm d: 330 mm w: 180 mm	• 150 x 150 mm • 85/140 mm • 300 x 150 x 150 mm • 330 x 180 x 395 mm	T100-ST5 amb.+15 to 100°C	TC120-ST5 0 to 120°C	TX150-ST5 0 to 150°C	TXF200-ST5 0 to 200°C
ST12 - 12L stainless steel  4.5 kg h: 215 mm d: 362 mm w: 330 mm	• 205 x 300 mm • 85/140 mm • 325 x 300 x 150 mm • 360 x 330 x 415 mm	T100-ST12 0 to 100°C	TC120-ST12 0 to 120°C	TX150-ST12 0 to 150°C	TXF200-ST12 0 to 200°C
ST18 - 18L stainless steel  7 kg h: 215 mm d: 540 mm w: 330 mm	• 385 x 300 mm • 75/130** mm • 505 x 300 x 150 mm • 540 x 330 x 415 mm	T100-ST18 0 to 100°C	TC120-ST18 0 to 120°C	TX150-ST18 0 to 150°C	TXF200-ST18 0 to 200°C
ST26 - 26L stainless steel  7.5 kg h: 265 mm d: 540 mm w: 330 mm	• 385 x 300 mm • 125/180** mm • 505 x 300 x 200 mm • 540 x 330 x 465 mm	T100-ST26 0 to 100°C	TC120-ST26 -15 to 120°C	TX150-ST26 -15 to 150°C	TXF200-ST26 -15 to 200°C
ST38 - 38L stainless steel  11 kg h: 260 mm d: 730 mm w: 330 mm	• 575 x 300 mm • 125/180** mm • 690 x 300 x 200 mm • 730 x 330 x 460 mm	T100-ST38 0 to 100°C	TC120-ST38 -15 to 120°C	TX150-ST38 -15 to 150°C	TXF200-ST38 -15 to 200°C
P5 - 5L plastic  2.5 kg h: 180 mm d: 325 mm w: 225 mm	• 120 x 150 mm • 85/140 mm • 240 x 160 x 155 mm • 325 x 235 x 380 mm	T100-P5 amb.+15 to 99°C	TC120-P5 amb.+15 to 99°C	TX150-P5 amb.+15 to 99°C	TXF200-P5 amb.+15 to 99°C
P12 - 12L plastic  3.5 kg h: 180 mm d: 415 mm w: 350 mm	• 210 x 280 mm • 85/140 mm • 325 x 280 x 155 mm • 415 x 350 x 380 mm	T100-P12 amb.+5 to 99°C	TC120-P12 amb.+5 to 99°C	TX150-P12 amb.+5 to 99°C	TXF200-P12 amb.+5 to 99°C
P18 - 18L plastic  5 kg h: 180 mm d: 600 mm w: 365 mm	• 375 x 280 mm • 85/140 mm • 510 x 290 x 155 mm • 600 x 350 x 380 mm	T100-P18 amb.+5 to 99°C	TC120-P18 amb.+5 to 99°C	TX150-P18 amb.+5 to 99°C	TXF200-P18 amb.+5 to 99°C

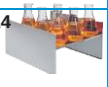
Note: Operation at or below ambient temperatures requires accessory cooling or a refrigeration unit on page 1.9

Options and accessories

Labwise TM PC software (optional)				
Allows two-way communication for status display, programming and data capture (see p. 3. 1 for more information) USB/RS232 cables provided	-	-		
External probes (optional) for monitoring and controlling temperature of remote loads				
TXPEP flexible plastic probe, 3m cable	-	-	●	●
TXSEP stainless steel probe, 3m cable	-	-	●	●
Remote switching device (optional)				
For switching appliances on and off (up to max. 8 Amps)	-	-	1	1
Vertical turbine pumps (optional)*				
Low noise, compact design. Supplied with pipe connections and special lid for fitting to tank, pipe bore 12.7mm		Required only where application demands a higher pressure than that delivered by the internal pump to maintain flow		
VTP 1 Max. pressure 1000 mbar Max. flow 9 L/min				
VTP 1 Max. pressure 1650 mbar Max. flow 12 L/min				

* When pump is fitted, available working area is reduced ** maximum depth can be increased by 10mm, by removing the circulation tray in 18, 26 and 38 litre baths, with slight loss of performance.

Accessories

Lids*	Lids	Polypropylene	Rack systems†	Raised shelves	Accessory cooling systems**		
to help reduce evaporation/ heat loss and avoid sample contamination	For continuous use with water above 90°C. Stainless steel.	spheres* 300 spheres in one pack (no. of packs required)	to optimise use of available bath capacity (no. of racks accommodated)	to allow shallow vessels to be accommodated	to allow systems to operate at or below ambient temperature by means of a cooling coil dipped into the bath; designed for minimal impact on working area		
					Refrigerated immersion coolers Consist of a cooling coil connected to a refrigeration unit by a flexible pipe. Extract heat continuously, with the bath control unit controlling temperature		**Heat exchange coil** Designed to be attached to a supply of cooling tap water or a refrigerated circulator
					C1G (0 to 40°C***)	**C2G** (- 15 to 40°C***)	**CW5** (2°C above coolant temperature)
STL5  flat stainless steel	–	**1 x PS20** 	**1 x QR** 	–		–	
STL12  gabled, hinged (removable) stainless steel	**LST12** 	**1 x PS20** 	**2 x VR** 	**RS14**  (h 40 or 78mm)		–	
STL26  gabled, hinged (removable) stainless steel	**LST26** 	**2 x PS20** 	**4 x VR** 	**RS22**  (h 40 or 78mm)		–	
STL26  gabled, hinged (removable) stainless steel	**LST26** 	**2 x PS20** 	**4 x VR** 	**RS28**  (h 45 or 135mm)			
STL38  gabled, hinged (removable) stainless steel	**LST38** 	**3 x PS20** 	**6 x VR** 	**RS28** or **RS38**  (h 45 or 135mm)			
PL5  flat, stainless steel	–	**1 x PS20** 	**1 x QR** 	–	–	–	–
PL12  curved plastic	–	**1 x PS20** 	**2 x VR** 	**RS14**  (h 40 or 78mm)	–	–	–
PL18  curved plastic	–	**2 x PS20** 	**4 x VR** 	**RS22**  (h 40 or 78mm)	–	–	–

P5 P12 P18

* Between operating temperatures 60°C and 100°C and below room temperature a lid or layers of polypropylene spheres should be used.

** The cooling coil can be continuously immersed in liquids up to 100°C with the cooler switched off, and may be used to cool liquid down from 100°C, but it is not designed for continuous operation above 40°C.

*** Minimum operating temperature without accessory cooling is ambient + 5°C (amb.+ 15°C for P5 and ST5 tanks).

† Rack capacity (no. of test tubes per rack)

VR racks	Tube size	Capacity
VR-13	ø 10-13 mm	65
VR-19	ø 16-19 mm	36
VR-24	ø 24 mm	23
VR-30	ø 30 mm	14
VR-SE	0.5 ml	102
VR-LE	1.5 ml	75

QR racks	Tube size	Capacity
QR-13	ø 10-13 mm	30
QR-19	ø 16-19 mm	16
QR-24	ø 24 mm	10
QR-30	ø 30 mm	5
QR-SE	0.5 ml	44
QR-LE	1.5 ml	35

Heating circulating baths - technical specifications

Grant Optima thermostats

● = standard

			Heating circulators			
			General purpose digital		Advanced digital	
			T100	TC120	TX150	TXF200
						
Stability (DIN 12876) @70°C		°C	± 0.05	± 0.05	± 0.01	± 0.01
Uniformity (DIN 12876) @ 70°C		°C	± 0.1	± 0.1	± 0.05	± 0.05
Setting resolution		°C	0.1	0.1	0.1 (0.01 with Labwise)	
Display			4 digit LED		full colour QVGA TFT	
Timer function			-	1 min to 99 hrs 59 mins		
No. of temperature presets			3	3	3	3
Re-calibration points			2	2	5	5
Socket for external probe (TXPEP, TXSEP)			-	-	●	●
Communications interface			-	-	USB, RS232	USB, RS232
Programmable			-	-	remote via PC / laptop 1 program / 30 segments	direct via user interface or remote via PC / laptop 10 programs / 100 segments
Relays			-	-	1	1
Safety	Over temperature		fixed	adjustable cut-out		
	fluid level - float		●	●	●	●
Language capability			-	-	EN, FR, DE, IT, ES	EN, FR, DE, IT, ES
Alarms (can be configured to switch a relay)			-	high (no relay)	high and low	high and low
Heater power	230 V	kW	1.3	1.3	1.9	1.9
	120 V	kW	1.4	1.4	1.4	1.4
Electrical power	230 V	kW	1.4 (50-60Hz)	1.4 (50-60Hz)	2.0 (50-60Hz)	2.0 (50-60Hz)
	120 V	kW	1.5 (50-60Hz)	1.5 (50-60Hz)	1.5 (50-60Hz)	1.5 (50-60Hz)
Height above tank rim		mm	200	200	200	200
Depth below tank rim		mm	135	135	145	145

Grant Optima™ thermostats

Maximum pressure	water	mbar	-	210	310	530
Maximum flow	water	L/min	-	16	18	22 (adjustable flow rate)
Pump connector	6 mm bore*		-	fits 9 mm inner diameter tubing		
Pump connector	11 mm bore*		-	fits 15 mm inner diameter tubing		

* 6 and 11 mm bore pump connectors supplied as standard. For more optic s see page 1.9

Grant immersion thermostats are suitable for use with Grant stainle ss steel and plastic tanks. With the addition of a clamp (T-Clamp) they can also be atta hed to virtually any vertical sided tank with a maximum wall thickness of 35mm for rec angular tanks, 30mm for circular tanks (300 mm diameter), and a capacity of up to 50 litres. Minimum and maximum temperatures achievable are dependent upon the tank insulation and minimum operating temperature depends on the accessory cooling device.

High pressure pumps (optional)

			VTP pumps	
			VTP1	VTP2
				
Maximum pressure	water	mbar	1000	1650
Maximum flow	water	L/min	9	12
Pipe bore	inlet/outlet	mm	12.7	12.7
Electrical connection			10 amp IEC	10 amp IEC
Power consumption		W	30	40
Power output to liquid @ 20°C		W	15*	22*
Safety			thermal fuse	thermal fuse

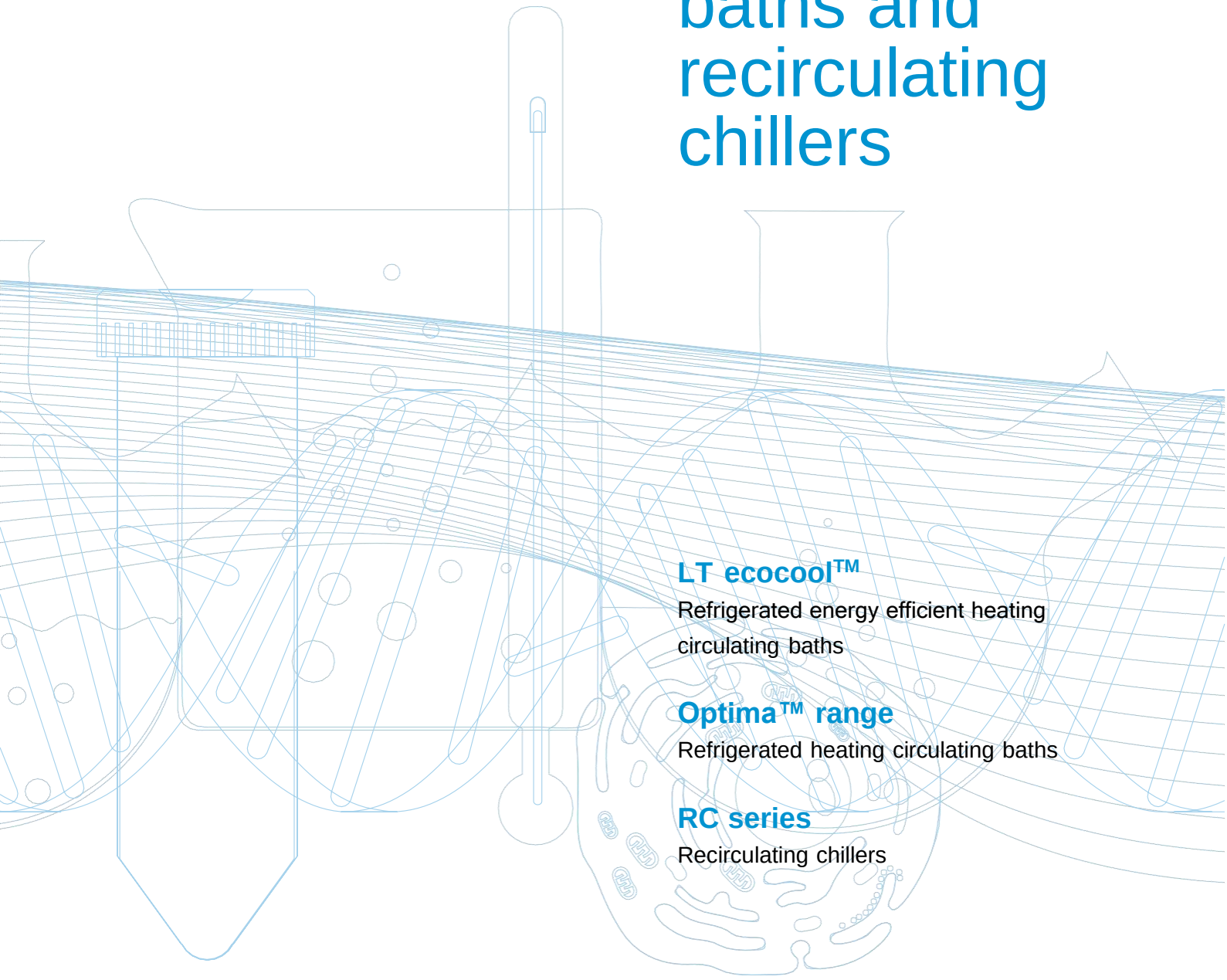
Accessory cooling systems

			Immersion coolers		Heat exchange coil
			C1G	C2G	CW5
					
Cooling power	@ 20°C	W	350	400	–
	@ 0°C	W	110	320	–
	@ -10°C	W	–	170	–
Overall consumption		VA	300	500	–
Dimensions	d/w/h	mm	460/305/225		–
Weight		kg	17	21	0.1
Flexible pipe	l	mm	925	925	–
Coil	ø /l	mm	77/55	77/55	77/55
Pipe bore inlet/outlet		mm	–	–	7
Electrical supply			120 V (60 Hz) or 230 V (50Hz)		–

Pump connectors (optional)

	Part number
Replacement plastic pump inlet/outlet connector. Fits tubing 9mm inner dia. Temperature range -50 to 200˚C	P-M6
Replacement plastic pump inlet/outlet connector. Fits tubing 15mm inner dia. Temp range -50 to 200˚C	P-M11
Stainless steel pump inlet/outlet connector, M16 x 1 male. Fits M16 hose. Temp range -50 to 200˚C	M-M16
Metal pump inlet/outlet connector, dual seal super rapid 4mm. Fits semi rigid tubing 4mm outer dia. Temp range -20 to 100˚C	M-SR4
Metal pump inlet/outlet connector, dual seal super rapid 6mm. Fits semi rigid tubing 6mm outer dia. Temp range -20 to 100˚C	M-SR6
Metal pump inlet/outlet connector, dual seal super rapid 8mm. Fits semi rigid tubing 8mm outer dia. Temp range -20 to 100˚C	M-SR8
Metal pump inlet/outlet connector, hose barb 7mm. Fits flexible tubing 7mm inner dia. Temp range -40 to 120˚C	M-HB7
Metal pump inlet/outlet connector, hose barb 9mm. Fits flexible tubing 9mm inner dia. Temp range -40 to 120˚C	M-HB9
Metal pump inlet/outlet connector, hose barb 12mm. Fits flexible tubing 12mm inner dia. Temp range -40 to 120˚C	M-HB12
Metal pump inlet/outlet plate, 1/4 " BSP/G1/4 female. Temp range -50 to 200˚C	M-UC

2 Refrigerated / heating circulating baths and recirculating chillers



LT ecocool™
Refrigerated energy efficient heating circulating baths

Optima™ range
Refrigerated heating circulating baths

RC series
Recirculating chillers

Refrigerated / heating circulating baths and circulator range

Cost-effective and efficient multi-purpose systems for cooling applications.

- New! innovative energy efficient models.
- Powerful precision cooling whether used in open-loop or closed-loop format.
- Combining legendary quality, reliability and design for everyday usage - useful features, straightforward maintenance, compact design.
- Robust, durable construction for longevity, reliability and long-term low cost of ownership.
- A comprehensive range - 11 models to cover basic through to sophisticated needs.
- Industry leading up to 4 years warranty.

Operating temperature

The LT ecocool™ range offers accurate temperature control from -30 to 200°C and is available in three models (LT ecocool™ 200 available 2016).

The R4 and R5 refrigeration range consist of two refrigeration units which can be combined with four heating circulators to offer a temperature range of -47°C to 100°C.

Liquids

We recommend the following liquids for use in Grant baths:

-50°C to 30°C: Silicone oil - low viscosity (Bayer silicone M3)
-30°C to 30°C: 50% water 50% antifreeze (inhibited ethylene glycol)
0°C to 30°C: 80% water 20% antifreeze (inhibited ethylene glycol)
5°C to 99.9°C: Water
70°C to 150°C: Silicone fluid (viscosity ~20cS, flash point ≥230°C, fire point ≥280°C)
70°C to 200°C: Silicone fluid (viscosity 50cS centistokes, flash point ≥285°C, fire point ≥340°C)

Always read the manual and warnings when choosing a fluid.

Factors to consider when choosing your system

- **Do you need to immerse samples within a tank?**

Consider the working area required. The table on p. 2.4 shows the dimensions of the top opening and the min/max liquid depths

- **Cooling power required at a given temperature**

For example, if your operating temperature is 0°C, and you need 500 W cooling power, you will need the R4 (or R5) refrigeration unit with any of the controllers. Alternatively to calculate the power required use the following formula:

$$W = \frac{V \times T \times K}{60 \times t \text{ (mins)}}$$

W = average cooling power	Water	K = 4200
V = total system liquid volume L	50/50 water/glycol	K = 3800
T = temperature difference °C	Alcohol	K = 2100
K = liquid heat capacity (J/L/°C)	Silicone oil	K = 1800

- **Cool-down time required to reach that temperature**

Calculate the cool-down time required according to the following formula, and refer to the cool down curves for individual performance.

$$t(\text{mins}) = \frac{V \times T \times K}{60 \times W}$$

- **Do you need to control the temperature of/remove the heat from an external device?**

1. Consider the pump requirement. Liquid flow rate is critical in order to maintain adequate exchange of heat within the external system. Flow rate is dependent on the restrictions within the system. Factors which cause a pressure drop are height, length, pipe bore and the number and angle of bends within the system. To maintain sufficient flow in a highly restricted system, a high pressure pump is required. The integral pumps in the Optima™ and LT ecocool™ series thermostats are satisfactory for most laboratory applications; for more powerful pump requirements select either of the Grant accessory vertical turbine pumps (VTP).

2. Consider whether you need to control the temperature within the external apparatus. For external temperature control choose TX150, TXF200 or LT ecocool™ 150/200 controller and an external temperature probe.

- **Do you require temperature ramping?**

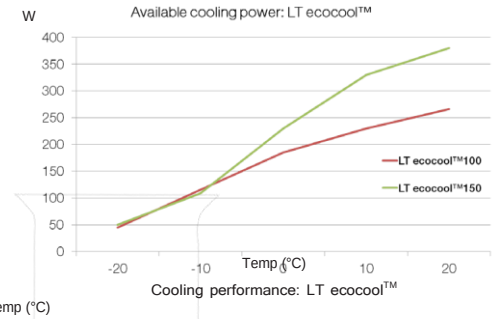
If yes, choose TX150, TXF200 or LT ecocool™ controller and Labwise™ accessory software. For refrigeration on/off control by programmable relay choose refrigeration units R4 or R5.

- **What other features do you require?**

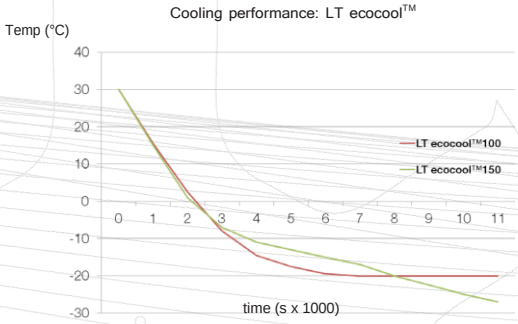
Consider the numerous features offered by the four Optima™ series or LT ecocool™ 150/200 controllers, and select the controller that meets your needs.

- **Help**

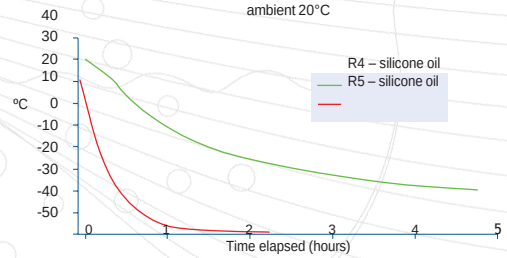
If you need help choosing the correct system please contact confident.cooling@grantinstruments.com or call +44 (0) 1763 264 778.



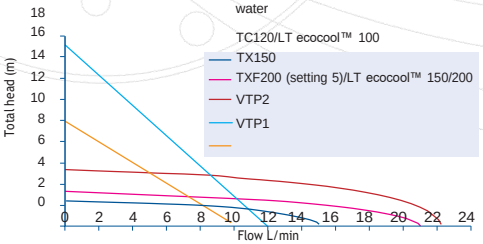
Cooling performance: LT ecocool™



Cooling performance: R4 & R5
ambient 20°C



VTP, LT ecocool™ and Optima™ thermostat pump performance
water



LT ecocool™ energy efficient refrigerated / heating circulating baths

A new range of innovative, eco-friendly, refrigerated heating circulating baths offering significant running cost savings whilst delivering powerful cooling. Consisting of three models, all products in the LT ecocool™ range are supplied assembled as ready to use kits, complete with accessory hosing*, clips and connectors as standard.

- **Choice of three models, temperature range -30°C to 200°C⁺ (model dependent)**
- **Industry leading 4 year warranty with Grant renowned service and support, no registration required**
- **Active cooling through the whole temperature range**
- **True energy saving of up to 80% against standard compressor units**

BUILT IN BRITAIN · 4 year warranty · CC™

* Temperature range of hosing supplied: -40 to 100°C (can be cut to length as required). Supplied tubing 2 x 1.5m ID 9mm Ø
⁺ LT ecocool™ 200 230V available 2016

eco mode optimises the cooling control needed, enabling rapid cool down when required

True energy saving against competitor units that only switch the compressor off

Intuitive user interface

No-spill valved front drain

Built in Britain to the highest specifications, 5 day dispatch, 4 year industry leading warranty

Full colour 5 language QVGA TFT display on both the ecocool 150 and ecocool 200 units

Modern, sleek, attractive design

Thermostat and chiller work in harmony, neither will operate alone, eliminating any danger of overheating or freezing

Single front switch for user convenience

No side vents, locate to suit the user, not the unit

Applications:

- Pharmaceutical - Mini pilot plant reactors
- Education - Rotary evaporator cooling, replacement of running tap water cooling, immersing small samples, photometry, chromatography systems
- Industrial - QC testing, sample preparation, general cooling, reaction chemistry, temperature control, semi-conductor manufacturing, rheometry
- Food - Refractometry
- Life-science - Electrophoresis cooling
- High temperature cooling - Active up to 200°C

LT ecocool™ refrigeration range - technical specification

			LT ecocool™ 100	LT ecocool™ 150	LT ecocool™ 200*
			 29 kg h: 640 mm d: 430 mm w: 245 mm	 29 kg h: 640 mm d: 430 mm w: 245 mm	 29 kg h: 640 mm d: 430 mm w: 245 mm
Temperature range		°C	-20 to 100	-25 to 150	-30 to 200
Temperature stability		±°C	0.05	0.02	0.01
Flow rate (max)		L/min	17	14 - 22 (adjustable)	
Pump pressure (max)		mbar	250	530	530
Tank volume		L	5	6	
Calibration points			2	5	
Cooling power (typical)	@ 20°C	W	250	350	500
	@ 10°C	W	230	330	430
	@ 0°C	W	185	230	300
	@ -10°C	W	115	109	140
	@ -20°C	W	45	50	50
Programs			-	1 x 30 segments via Labwise™	10 x 100 segments
Communication interface			-	USB	
Temperature probe socket			-	6 pin mini DIN	
Display			4 d it LED	Full colour QVGA TFT	
Languages			-	5 (EN, FR, DE, IT, ES)	
Weight		kg	29		
Timer			1 min to 99 hrs 59 mins		
Temperature presets			3		
Alarms			gh	High and low	
Electrical power (max) kW		120V/230V	2.16/2.0 (60/50 Hz)	2.28/2.76 (50-60 Hz)	-/2.76 (50-60 Hz)
Safety			Adjustable over temperature cut-out		
Ready to use kits			Assen led and supplied with standard tubing, insulation, clips and connectors		

* available 2016

Options and accessories

Labwise™ PC software (optional)			
Allows two-way communication for status display, programming and data capture (see p. 3.1. for more information). USB cable provided	-		
External probes			
PEP plastic probe	-	•	•
SEP stainless steel probe	-	•	•
Vertical turbine pumps (optional) - when pump is fitted, available working ar a is reduced.			
Low noise, compact design. Supplied with pipe connections and special lid for fitting to tank, pipe bore 12.7 mm. **VTP1-LT** maximum pressure 1000 mbar maximum flow 9 L/min **VTP2-LT** maximum pressure 1650 mbar maximum flow 12 L/min		Required only where application demands a higher pressure than that delivered by the internal to maintain flow. Note: The optional VTP pumps will transfer additional heat to the baths and reduce the net cooling power of the refrigeration unit. The above figures must be taken into consideration when choosing the refrigeration unit. when ordering a VTP pump, please specify which refrigeration base unit it is to be used with. Note: Other sizes of heat exchange coil can be made to your specification, contact us for further information	
Heat exchange coil			
CW5 Other sizes of heat exchange coil can be made to your specification, contact us for further information		Temperature range: 2°C above the temperature of the coolant Coil Øxl (mm): 77x55 Pipe bore inlet/outlet (mm): 7	
Hose Kits			
HOSE100 General purpose hose kit: -40 to 100˚C **HOSE200** High temperature hose kit: -50 to 200˚C		Hose kit 2 x 2m, assembled with Optima™ pump outlet plate and simple hose clips, no tools required	

High pressure pumps (optional)

			VTP pumps		Heat exchange coil
			VTP1-LT	VTP2-LT	CW5
					
Maximum pressure	water	mbar	1000	1650	-
Maximum flow	water	L/min	9	12	-
Pipe bore	inlet/outlet	mm	12.7	12.7	7
Electrical connection			10 amp IEC	10 amp IEC	-
Power consumption		W	30	40	-
Power output to liquid @ 20°C		W	15	22	-
Safety			thermal fuse	thermal fuse	-
Temperature range		°C	-	-	2°C above coolant temperature
Coil Øxl		mm	-	-	77 x 55

Optima™ refrigerated baths and circulators range

A collection of high performance refrigeration units which can be combined with any of 4 Optima™ heated circulators to deliver outstanding temperature performance for routine and sophisticated applications requiring accurate temperature control in the range of -47°C to 100°C. Grant also offer the LTC4 (TX150 - R4) which is available as a kit with the circulator, refrigeration unit and insulated tubing* to form a ready to use system.

- **Choice of two base refrigeration units and four heating circulators, temperature range -47°C to 100°C (model dependent)**
- **Stability of up to ±0.1°C**
- **Up to 4 years warranty**
- **No spill valved front drain**
- **Safe - water freeze protection thermostat and 27 bar high pressure switch**
- **3 preset programs**

3 year warranty

* Temperature range of hosing supplied: -40 to 100°C (can be cut to length as required).

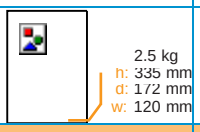
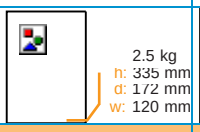
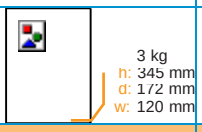
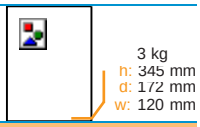
Grant R series refrigeration units - models and specifications

● = standard

			R4	R5	LTC4
			40 kg h: 530 mm d: 490 mm w: 390 mm	47 kg h: 585 mm d: 575 mm w: 415 mm	43 kg h: 730 mm d: 490 mm w: 390 mm
Temperature range with T100 heating circulator		°C	0 - 100	0 - 100	-
Temperature range with TC120 heating circulator		°C	-20 to 100	-20 to 100	-
Temperature range with TX150 heating circulator		°C	-30 to 100	-47 to 100	-30 to 100
Temperature range with TXF200 heating circulator		°C	-30 to 100	-47 to 100	-
Refrigerant			R134a	R404a	R134a
Capacity		L	20	12	20
Cooling power	@ 20°C	W	900	1100	900
	@ 0°C	W	500	1050	500
	@ -10°C	W	300	800	300
	@ -20°C	W	180	580	180
	@ -30°C	W	40	370	40
	@ -40°C	W	-	130	-
	@ -47°C	W	-	25	-
Electrical power (maximum)	120/230V	W	780 / 850 (50 - 60 Hz)	- / 1400 (50 - 60 Hz)	2280 / 2850
Relay control*			●	●	●

* Relay output to enable control of refrigeration system or external device.

Grant Optima™ heated circulators

			General purpose digital		Advanced digital	
			T100	TC120	TX150	TXF200
			 2.5 kg h: 335 mm d: 172 mm w: 120 mm	 2.5 kg h: 335 mm d: 172 mm w: 120 mm	 3 kg h: 345 mm d: 172 mm w: 120 mm	 3 kg h: 345 mm d: 172 mm w: 120 mm
Stability (DIN 12876)	water @ 10°C	°C	±0.1	±0.1	±0.1	±0.1
Setting resolution		°C	0.1	0.1	0.1 (0.01 with Labwise)	
Programs			-	-	1 x 30 segments via Labwise™	10 x 100 segments
Safety	over temperature		fixed	adjustable cut-out		
Alarms (can be configured to switch a relay)			-	high (no relay)	high and low	high and low
Language capability			-	-	EN, FR, DE, IT, ES	EN, FR, DE, IT, ES
Height above tank rim		mm	200	200	200	200
Depth below tank rim		mm	135	135	135	135
Display			4 digit LED		Full colour QVGA TFT	
Timer			-	1 min to 99 hrs, 59 mins		
Calibration points			2		5	
Communication interface			-		USB, RS232, Temperature probe	
Heater power	kW 230/120V		1.3 / 1.4		1.9 / 1.4	
Electrical power	kW 230/120V		1.4 / 1.5		2.0 / 1.5	

Grant Optima™ thermostat pumps (integral)

Maximum pressure	water	mbar		210	310	530
Maximum flow	water	L/min		16	18	22 (adjustable flow rate)
Pump connector	6 mm bore			fits 9 mm inner diameter tubing		
Pump connector	11 mm bore			fits 15 mm inner diameter tubing		

Options and accessories

Labwise™ PC software (optional)			
Allows two-way communication for status display, programming and data capture (see p. 3.1. for more information). USB cable provided	-		
External probes			
TXPEP plastic probe	-	•	•
TXSEP stainless steel probe	-	•	•
Vertical turbine pumps (optional) - when pump is fitted, available working area is reduced.			
Low noise, compact design. Supplied with pipe connections and special lid for fitting to tank, pipe bore 12.7 mm. **VTP1** maximum pressure 1000 mbar maximum flow 9 L/min **VTP2** maximum pressure 1650 mbar maximum flow 12 L/min	 	Required only where application demands a higher pressure than that delivered by the internal to maintain flow. Note: The optional VTP pumps will transfer additional heat to the baths and reduce the net cooling power of the refrigeration unit. when ordering a VTP pump, please specify which refrigeration base unit it is to be used with.	
Heat exchange coil			
CW5 Other sizes of heat exchange coil can be made to your specification, contact us for further information		Temperature range: 2°C above the temperature of the coolant Coil Øxl (mm): 77x55 Pipe bore inlet/outlet (mm): 7	
Hose Kits			
HOSE100 General purpose hose kit: -40 to 100˚C **HOSE200** High temperature hose kit: -50 to 200˚C		Hose kit 2 x 2m, assembled with Optima™ pump outlet plate and simple hose clips, no tools required (can be cut to length as required)	

High pressure pumps (optional)

			VTP pumps		Heat exchange coil
			VTP1	VTP2	CW5
					
Maximum pressure	water	mbar	1000	1650	-
Maximum flow	water	L/min	9	12	-
Pipe bore	inlet/outlet	mm	12.7	12.7	7
Electrical connection			10 amp IEC	10 amp IEC	-
Power consumption		W	30	40	-
Power output to liquid @ 20°C		W	15	22	-
Safety			thermal fuse	thermal fuse	-
Temperature range		°C	-	-	2°C above coolant temperature
Coil Øxl		mm	-	-	77 x 55

Optional accessories

Optional accessories

● = compatible	LT ecocool™ 100	LT ecocool™ 150	LT ecocool™ 200	T100-R4/R5	TC120-R4/R5	TX150-R4/R5	TXF200-R4/ R5
Labwise™ software (see section 3 for further information) 	-	●	●	-	-	●	●
Temperature probes, 3m cable							
TXPEP plastic probe	-	-	-	-	-	●	●
TXSEP stainless steel probe		-	-			●	●
PEP plastic probe		●	●			-	-
SEP stainless steel probe		●	●			-	-
VTP1-LT maximum pressure 1000 mbar maximum flow 9 L/min 	●	●	●				
VTP2-LT maximum pressure 1650 mbar maximum flow 12 L/min 	●	●	●	-	-	-	-
VTP1-PLR4/VTP1-PLR5 maximum pressure 1000 mbar maximum flow 9 L/min 	-	-	-	●	●	●	●
VTP2-PLR4/VTP2-PLR5 maximum pressure 1650 mbar maximum flow 12 L/min 				●	●	●	●
CW5 heat exchange coil 	●	●	●	●	●	●	●
IQOQ documentation	IQOQ LT ecocool 100	IQOQ LT ecocool 150	IQOQ LT ecocool 200	IQOQ T100 + IQOQ R4 IQOQ T100 + IQOQ R5	IQOQ TC120 + IQOQ R4 IQOQ TC120 + IQOQ R5	IQOQ TX150 + IQOQ R4 IQOQ TX150 + IQOQ R5	IQOQ TXF200 + IQOQ R4 IQOQ TXF200 + IQOQ R5
PQ documentation	PQ LT ecocool 100	PQ LT ecocool 150	PQ LT ecocool 200	PQ T100 + IQOQ R4 PQ T100 + IQOQ R5	PQ TC120 + IQOQ R4 PQ TC120 + IQOQ R5	PQ TX150 + IQOQ R4 PQ TX150 + IQOQ R5	PQ TXF200 + IQOQ R4 PQ TXF200 + IQOQ R5
Extended warranty 1 year **EWC1**	●	●	●	●	●	●	●
Extended warranty 2 years **EWC2**	-	-	-	●	●	●	●

Optional accessories

Pump connectors (optional)		Part number
	Replacement plastic pump inlet/outlet connector. Fits tubing 9mm inner dia. Temp range -50˚C to 200˚C	**P-M6**
	Replacement plastic pump inlet/outlet connector. Fits tubing 15mm inner dia. Temp range -50˚C to 200˚C	**P-M11**
	Stainless steel pump inlet/outlet connector, M16 x 1 male. Fits M16 hose. Temp range -50˚C to 200˚C	**M-M16**
	Metal pump inlet/outlet connector, dual seal super rapid 4mm. Fits semi rigid tubing 4mm outer dia. Temp range -20˚C to 100˚C	**M-SR4**
	Metal pump inlet/outlet connector, dual seal super rapid 6mm. Fits semi rigid tubing 6mm outer dia. Temp range -20˚C to 100˚C	**M-SR6**
	Metal pump inlet/outlet connector, dual seal super rapid 8mm. Fits semi rigid tubing 8mm outer dia. Temp range -20˚C to 100˚C	**M-SR8**
	Metal pump inlet/outlet connector, hose barb 7mm. Fits flexible tubing 7mm inner dia. Temp range -40˚C to 120˚C	**M-HB7**
	Metal pump inlet/outlet connector, hose barb 9mm. Fits flexible tubing 9mm inner dia. Temp range -40˚C to 120˚C	**M-HB9**
	Metal pump inlet/outlet connector, hose barb 12mm. Fits flexible tubing 12mm inner dia. Temp range -40˚C to 120˚C	**M-HB12**
	Metal pump inlet/outlet plate, 1/4 " BSP/G1/4 female. Temp range -50˚C to 200˚C	**M-UC**
	General purpose hose kit, includes 2 x 2m general purpose insulated hosing -40 to 100˚C, assembled with LT ecocool™/Optima™ pump outlet plate and simple hose clips, no tools required	**HOSE100**
	High temperature hose kit, includes 2 x 2m high temperature insulated hosing -50 to 200˚C, assembled with LT ecocool™/Optima™ pump outlet plate and simple hose clips, no tools required (illustrative image)	**HOSE200**

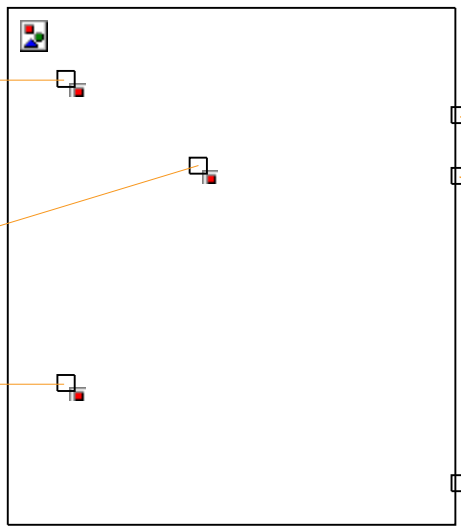
Recirculating chillers

RC series

Comprehensive range of robust re-circulating chillers delivering a constant flow of temperature-controlled liquid to provide powerful, regulated cooling at -10ºC for many types of industrial machinery and scientific apparatus. Suitable for circulation through open and closed systems.

- **Temperature range -10ºC to 60ºC or -5ºC to 60ºC (model dependent)**
- **Stability ±0.25ºC or ±0.5ºC (model dependent)**
- **Choice of models with different cooling power – from 350 to 3000W**
- **Efficient, reliable and cost-effective alternative to cooling with mains water**

RC350G recirculating chiller



Choice of four models – three acting as recirculating chillers/heaters, one as a powerful dedicated recirculating chiller (**RC3000G**)

Digital controller for accurate and reproducible temperature setting. User-selectable high and low temperature alarms

Robust construction, using corrosion resistant materials – long term durability and reliability in demanding applications

Inbuilt safety features protect the user, equipment and application from over temperature, under temperature and flow failure

A useful TUNE facility enables automatic optimisation of the chiller's closed-loop temperature control parameters to meet specific user requirements

Lockable wheels allow RC units to be moved easily from location to location and ensure that they stay put once in position

Applications:

- Electronics - cooling system for etch baths, glass coating for top-up display in aircrafts
- Industry - print head cooling for textile industry, calibration system probe
- Academia - physics and astronomy lab equipment cooling, sea water cooling for producing ikatite minerals
- Research - seed research, cooling of scientific X-ray analytical units, SEM cooling

Products for special low temperature applications – models and specifications

● = standard

	Re-circulating chillers – digital control			
	RC350G	RC400G	RC1400G	RC3000G**
	42 kg h: 510 mm d: 600 mm w: 370 mm	42 kg h: 510 mm d: 600 mm w: 370 mm	53 kg h: 590 mm d: 630 mm w: 380 mm	88 kg h: 640 mm d: 840 mm w: 490 mm
Temperature range °C	-5 to 60	-10 to 60		
Stability (DIN 58966) @ 20°C using water °C	±0.25*			±0.5#
Display	LED			
Display resolution °C	1.0			
Typical cooling power @ 20°C W	350	400	1300	3000
@ 0°C W	120	150	600	1500
@ -10°C W	–	20	150	575
Heater power kW	0.75		1.5	–**
Overall consumption 220/240 V kW	1.5		3.0	2.0
Liquid flow rate, maximum L/min	15	12	15	
Pump head pressure @ 1 L/min bar	1.6	0.62	1.6	
Pipe connection, inlet/outlet 3/8" BSP male	●			
Reservoir capacity L	1.7	1.7	2.5	1.1
Safety: – temperature switchable undertemperature thermostat	●			
– temperature fixed over temperature cut-out	●			–
– level flow-fail device	●			
Refrigerant	R134a	R134a	R134a	R134a
Electrical supply V	230 (50 Hz)			
EMC emissions Class	B	B	A	B

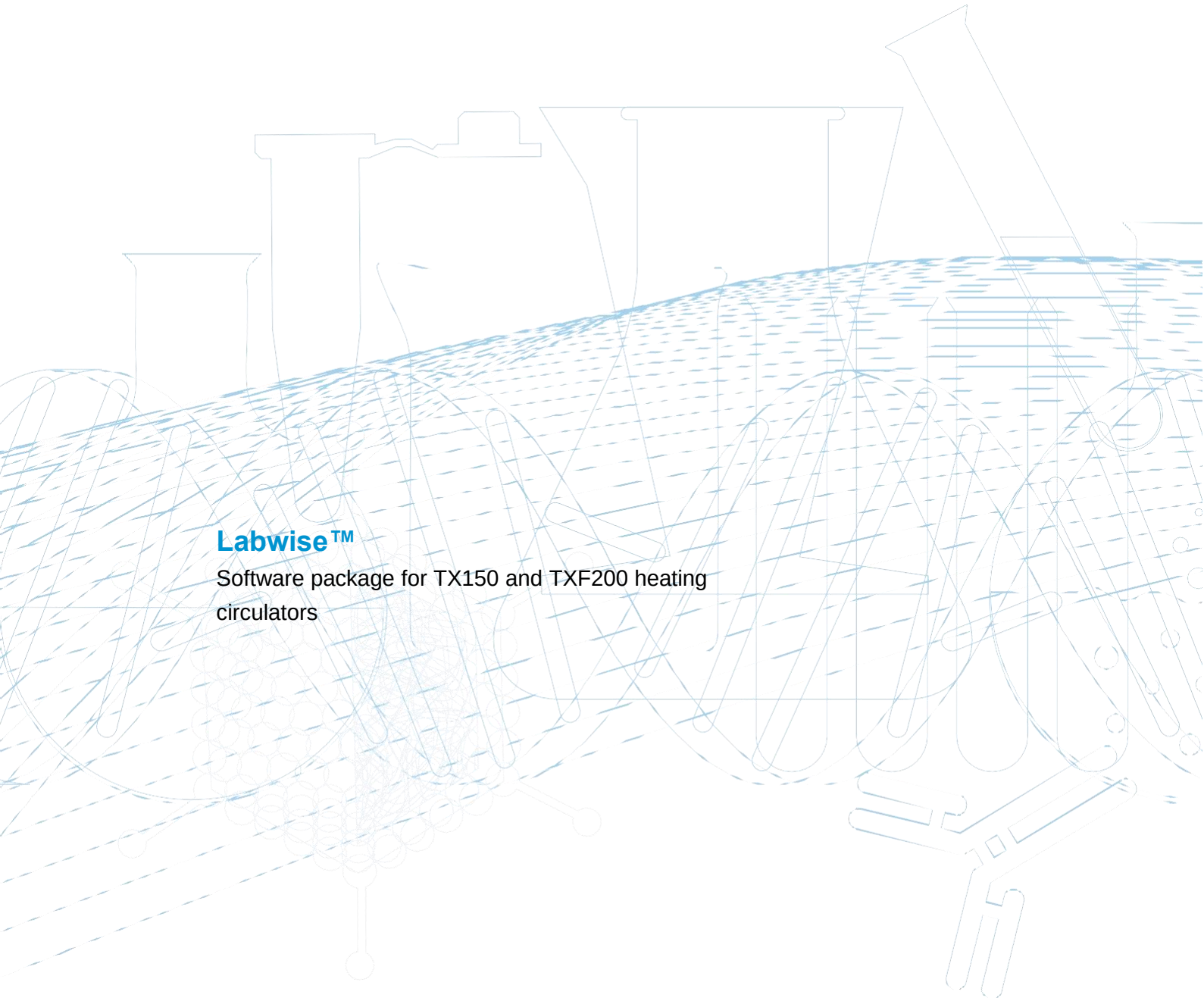
* with 10 litres of water in the system # with 25 litres of water in the system

** RC3000G has no heater so can only control against a heat load

Accessories for RC series

- **RC BYP** – bypass to overcome flow restrictions (flow < 1 L/min), e.g. in narrow tubes or small cells
- **RC PR** – pressure gauge to assist with setting up cooling systems and monitoring performance
- **PRES** – priming reservoir to simplify priming in a close loop system which has no filling port available on the RC inlet (not required for RC3000G)
- **External probe** – for remote sensing temperature control. On request only. Specify when ordering, requires modification to chiller
- **RC HF9, RC HF12, RC HF17** – Rear connecting fittings (pair) for 9, 12 and 17 mm internal diameter hose sizes respectively

3 Control and analysis software for heating circulators



Labwise™

Software package for TX150 and TXF200 heating circulators

Labwise™ control and analysis software for the laboratory

Labwise™ is a powerful and convenient software package for programming, controlling and recording key parameters of high performance baths and circulators in the Grant Optima™ range via a PC.

- **Full control of set-up, multi-segment programming and data logging for heating and cooling**
- **Real-time status windows with graphic display including zooming and scaling**
- **Operates in combination with Grant Optima™ TX150 and TXF200 series baths and circulators ***
- **Enables easy control of relays and remote switching devices, including multiple segments**

Labwise™ set-up features

- set temperature
- set high and low alarms; alarms can be configured to switch a relay
- set reaction timer
- set delayed start and stop time
- control of output relays for refrigeration on/off control and operating ancillary equipment
- control of pump speed for TXF200

Labwise™ programming features

- set cool or heat time to target
- program values may be set graphically or numerically
- up to 30 segments per program
- set number of loops, 1 to 254 or infinite looping between selected way points
- programmed control of output relays for each segment, for operating ancillary equipment
- control of pump speed for TXF200

Labwise™ display and logging features

- display of temperature/time profile on screen in real time
- real time zoom and scaling of graphical display
- logging of temperature profiles to disk for storage and subsequent analysis
- store programs to disk

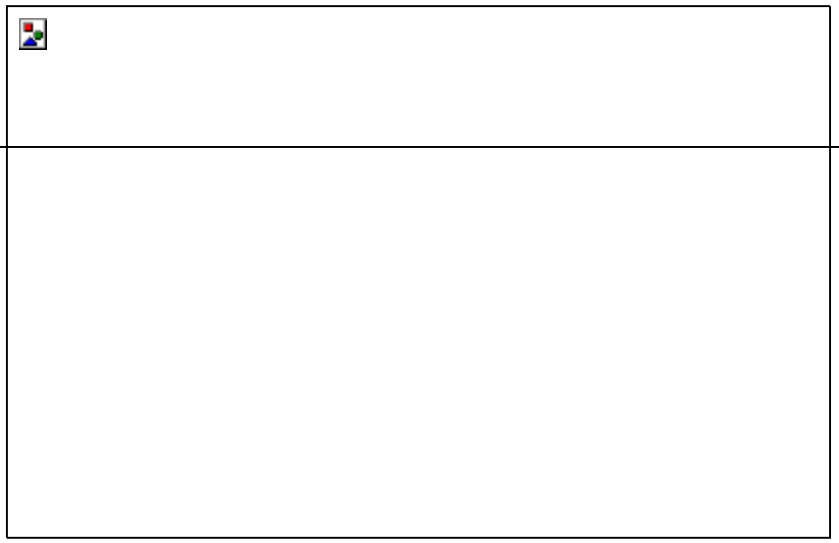
* Also compatible with Grant Optima GR150 and GP200

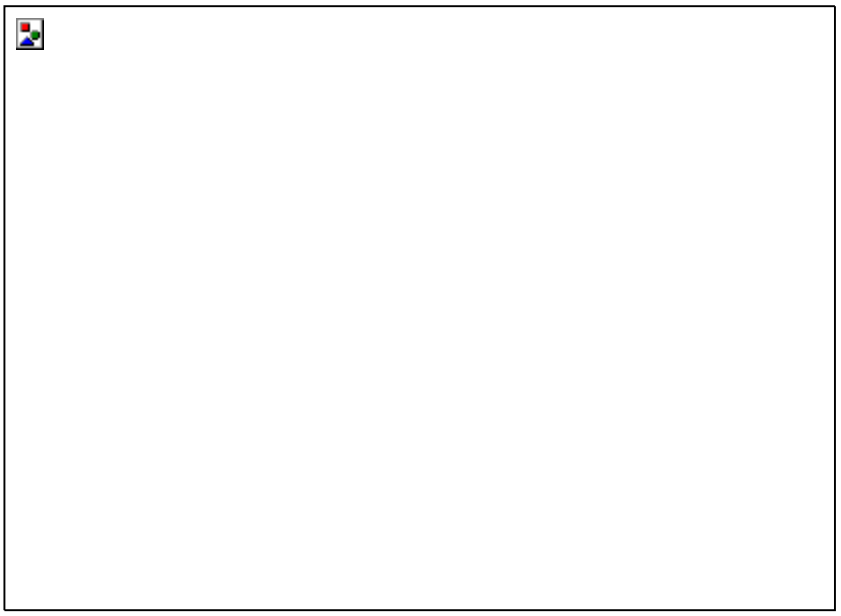
Labwise™ control and analysis software for the laboratory

Remote switching device

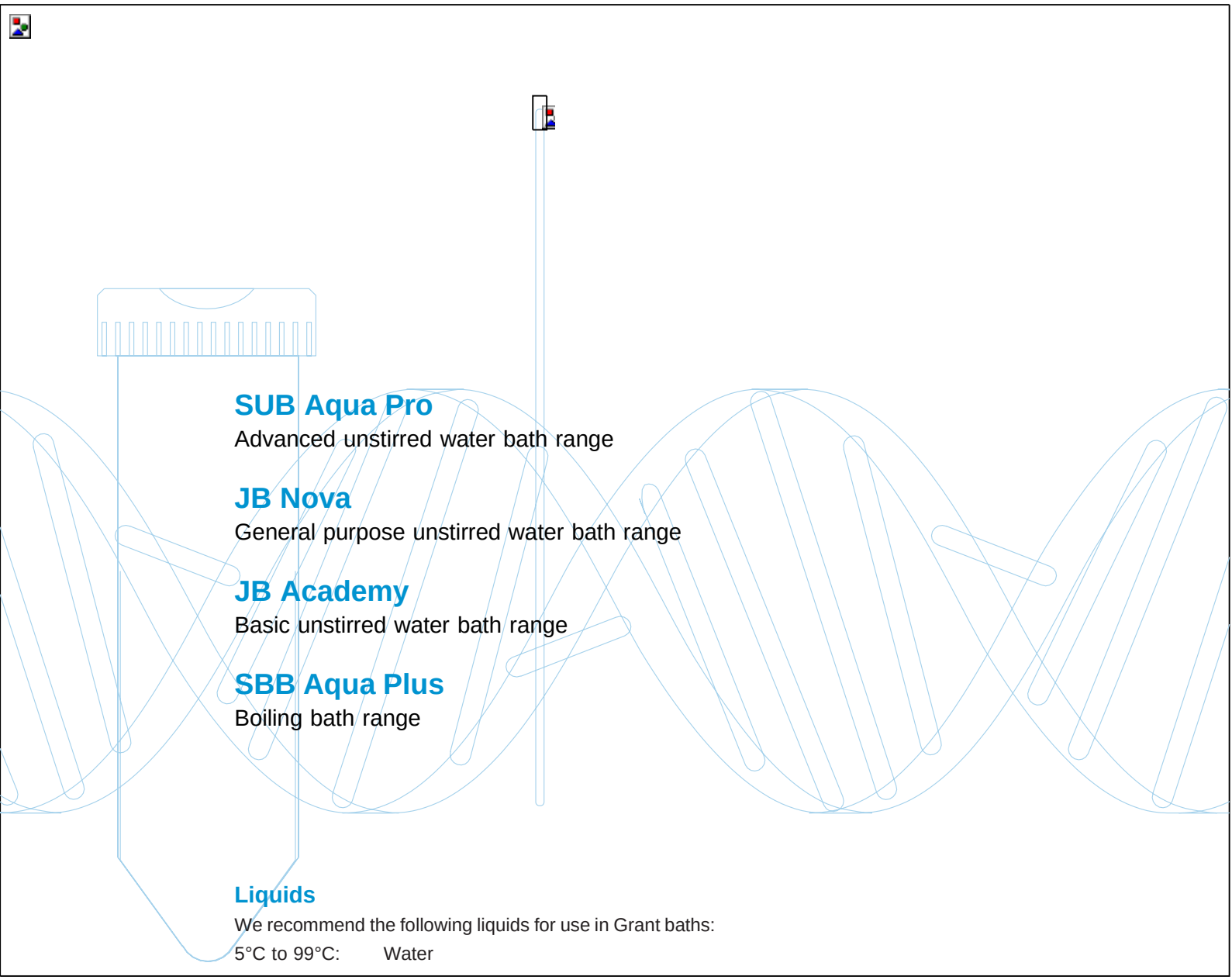
When used in combination with a remote switching device (RSD), the TX150 and TXF200 controllers can control, by switching on and off, any mains powered appliance (up to a maximum of 8 Amps).

This function can be programmed with Labwise™ software or alternatively directly on the TXF200 controller.





4 Unstirred water baths



SUB Aqua Pro

Advanced unstirred water bath range

JB Nova

General purpose unstirred water bath range

JB Academy

Basic unstirred water bath range

SBB Aqua Plus

Boiling bath range

Liquids

We recommend the following liquids for use in Grant baths:

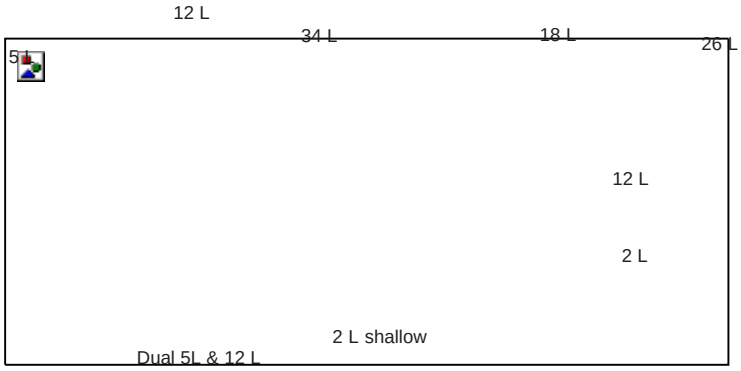
5°C to 99°C: Water

Unstirred water baths

The reliability, quality and consistent performance of Grant products have made Grant a leading manufacturer of water baths for decades.

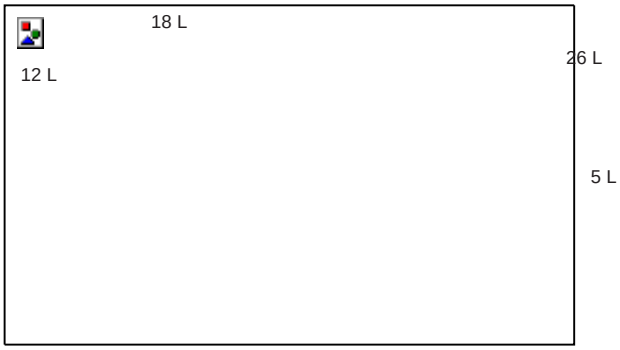
- A new era for Grant water baths – now all models from basic through to advanced have digital controls
- Proven performance – technology to deliver temperature control you can rely on
- Set and Forget™ technology - fast heat up, accurate temperature control

3 year warranty

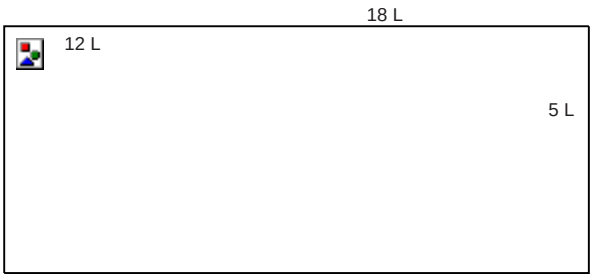


SUB Aqua Pro - advanced water bath range with a choice of 8 models. Supplied with base tray, lid and drain on larger baths

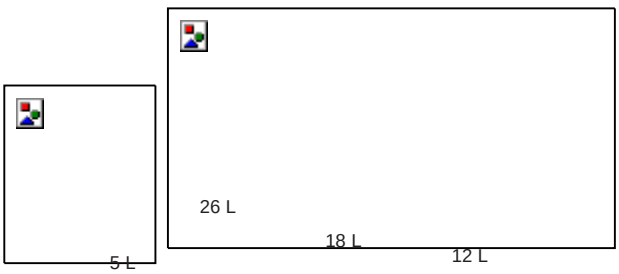
JB Nova - general purpose water bath range with a choice of 4 models. Supplied with base tray, lid and drain on larger baths



JB Academy - basic range with a choice of 3 models. Supplied with base tray.



SBB Aqua Plus boiling bath range – choice of four models. Supplied with polycarbonate lid and stainless steel base tray.



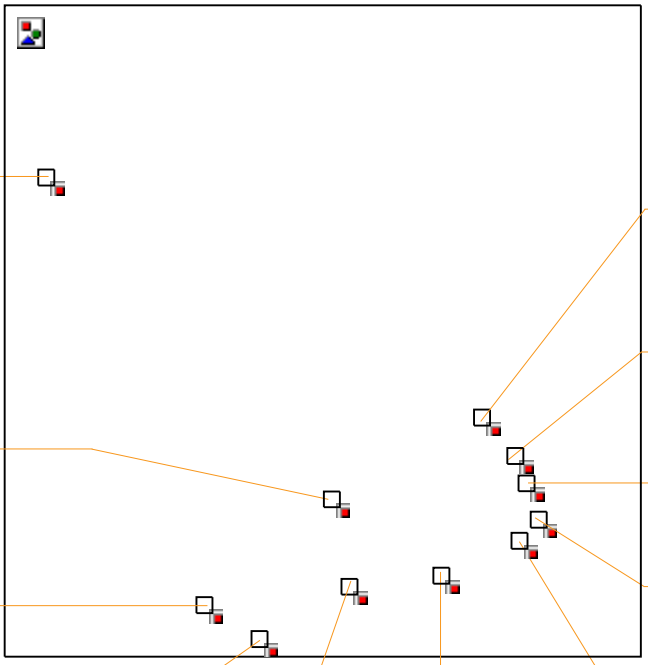
Comparison of features & specifications

	JB Academy (JBA)	JB Nova (JBN)	SUB Aqua Pro (SAP)
			
Temperature range	ambient + 5 to 95°C	ambient + 5 to 95°C	ambient + 5 to 99°C
Temp.display and setting resolution	0.5°C	0.5°C	0.1°C
Temp stability (DIN 12876) @ 70°C	±0.5°C	±0.5°C	±0.2°C
Temperature setting/energy regulation	digital		
Front panel lock	●	●	●
Fixed thermal cut-out	●	●	●
Dry start/boil dry protection	●	●	●
User calibration	1pt	1pt	2pt
Element free tank	●	●	●
Drain tap (all baths 12L and above)		●	●
Lid as standard		●	●
User adjutable over temp.alarm			●
Programmable temp. presets			3
Countdown timer with audible alarm			1 to 999 mins
Supply voltage V	230	120 or 230	120 or 230

Advanced digital water bath range - SUB Aqua Pro

Built to the highest standard and specifications, and incorporating the latest technology the SUB Aqua Pro advanced water bath range supports even the most demanding applications requiring accurate temperature control. Choose from eight models with base tray and lid included as standard.

- **Ambient +5°C to 99°C operation**
- **Set and Forget™ technology - fast heat-up, accurate temperature control**
- **Stability ±0.2°C**
- **Adjustable over temperature alarm - protect samples from over heating**
- **Advanced dry start and run dry protection**
- **Suitable for use with heat transfer beads (excluding SAP2 & SAP2S)**
- **3 year warranty**



Grant non-drip clear lid, included as standard – improves performance, limits evaporation and conserves energy

Advanced dry run and run dry protection - prevents costly service repairs in case bath is switched on or run without water. Simply fill and restart

Drain tap – allows convenient emptying on 12L, 18L, 26L, 34L, dual 5&12L baths

Heater mat and sensor bonded to underside of tank – optimised uniformity and work space. Tank easy to clean.

Three programmable temperature presets – allows commonly used temperatures to be quickly selected

User calibration – single or dual-point for optimum accuracy at your working temperatures

SAP12 model shown

Clear, wide-angle viewing LED display - instant reassurance of bath status

Front panel lock disables front panel controls preventing unintentional temperature changes

User settable over-temperature alarm – provides sample protection. Alerts the user and cuts off heating at user defined temperature

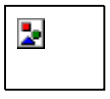
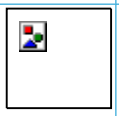
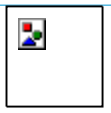
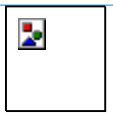
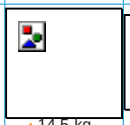
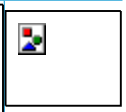
Fixed thermal cut-out - independent safety cut-out

Countdown timer (1-999 mins) with audible buzzer – for accurate reaction timing

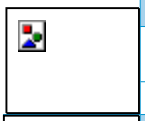
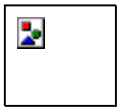
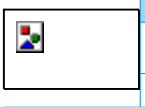
Markets: Pharma/biotech, education, industry, healthcare

Applications: Sample preparation, sample incubation, sample warming, sample thawing, media preparation, QC materials, practical science demonstration

SUB Aqua Pro digital unstirred water bath range - summary of specifications

	Advanced unstirred baths – SUB Aqua Pro							
	SAP2	SAP2S	SAP5	SAP12	SAP18	SAP26	SAP34	SAPD
	 3 kg h: 200 mm d: 200 mm w: 185 mm	 3 kg h: 150 mm d: 215 mm w: 335 mm	 3 kg h: 200 mm d: 215 mm w: 335 mm	 6 kg h: 225 mm d: 380 mm w: 360 mm	 9 kg h: 275 mm d: 590 mm w: 335 mm	 9 kg h: 275 mm d: 590 mm w: 335 mm	 14.5 kg h: 275 mm d: 770 mm w: 335 mm	 9 kg h: 225 mm d: 380 mm w: 545 mm
Tank capacity	2L	2L (shallow)	5L	12L	18L	26L	34L	5L & 12L
Temperature range	ambient + 5 to 99°C							
Temp. display and setting resolution	0.1°C							
Temp stability (DIN 12876) @ 70°C	±0.2°C							
Temperature setting/energy regulation	digital							
User adjustable over temp. alarm	●							
Fixed thermal cut-out	●							
Dry start/run dry protection	●							
Programmable temp. presets	3							
Countdown timer with audible alarm	1 to 999 mins							
Working area l x w mm	117 x 131	139 x 289	131 x 281	281 x 306	485 x 281	481 x 278	635 x 281	131/281 & 281/306
Drain tap	–	–	–	●	●	●	●	●
Heater power 120V/230V kW	0.25/0.25	0.35/0.35	0.35/0.35	0.8/0.8	1.4/1.05	1.4/1.05	1.8/1.3	1.15/1.15
Supply voltage V	120 or 230							
	CE and CSA approved							

Options and accessories

	SAP2	SAP2S	SAP5	SAP12	SAP18	SAP26	SAP34	SAPD
	2L	2L	5L	12L	18L	26L	34L	5L and 12L
	**Replacement polycarbonate transparent lids***							
	AQL2	**AQL5**	**AQL5**	**AQL12**	**AQL26**	**AQL26**	–	**AQL5, AQL12**
	Directs condensation away from immersed vessels, avoids contamination, reduces evaporation and saves energy							
	**Stainless steel sloping lids***							
	–	**LU6**	**LU6**	**LU14**	**LU28**	**LU28**	**LU36**	**LU6 & LU14**
	**Flat lids***							
	–	–	**LF6** (2 ring sets)	**LF14** (4 ring sets)	**LF28** (6 ring sets)	**LF28** (6 ring sets)	**LF36** (8 ring sets)	**LF6 / LF14**
	With ring sets of variable hole diameter to accommodate tall vessels whilst reducing evaporation							
	**Polypropylene spheres*** (packs per bath)							
	1 x **PS20**	1 x **PS20**	1 x **PS20**	1 x **PS20**	2 x **PS20**	2 x **PS20**	3 x **PS20**	2 x **PS20**
	Useful alternative to a lid, minimises evaporation and heat loss whilst allowing easy access to vessels in the bath; particularly useful for tall vessels							
	**Raised shelves** – reversible, allows two shelf depths. h = shelf height above tank base (mm)							
	–	–	–	**RS14H** (h 40 or 78) shelf covers half area of SAP12	**RS18H** (h 40 or 135) shelf covers half area of SAP18	**RS28H** (h 45 or 135) shelf covers half area of SAP26	**RS36H** (h 45 or 135) shelf covers half area of SAP34	**RS14H** (h 40 or 78) shelf covers half area of SAPD
	**Racks** (no. per bath)							
	-	-	1 x **J2**	2 x **J2**	4 x **J2**	4 x **J2**	6 x **J2**	1 + 2 x **J2**
	Choice of 8 variants to accommodate different tube diameters and microtubes (see below)							
	**Replacement base trays**							
	AQBT2	**AQBT5**	**AQBT5**	**AQBT12**	**AQBT26**	**AQBT26**	**SBT36**	**AQBT5 & AQBT12**
	Required if flat-bottomed flasks are to be placed directly on the base of the bath and to promote thermal convection in the bath							
	**Drain stopper**							
	-	-	-	**UWB-DS** (pack of 5)	**UWB-DS** (pack of 5)	**UWB-DS** (pack of 5)	**UWB-DS** (pack of 5)	**UWB-DS** (pack of 5)
	Recommended when using heat transfer beads, to prevent beads entering drain hole							

* lid or spheres recommended for use above 60°C

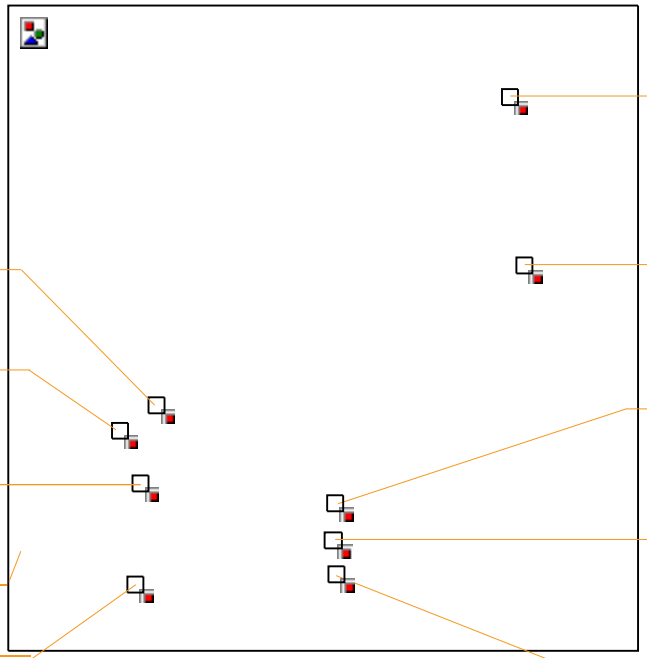
Unstirred Bath Racks

J2 Racks	Tube size Ø	Capacity	J2 Racks	Tube size Ø	Capacity
J2-10	10 mm	84	J2-25	25 mm	18
J2-13	13 mm	55	J2-30	30 mm	12
J2-16	16 mm	36	J2-SE	0.5 ml	105
J2-19	19 mm	32	J2-LE	1.5 ml	65

General purpose digital water bath range – JB Nova

General purpose water baths with stable temperature control, simple interface and fast heat-up. A choice of four models with a base tray and lid included as standard.

- **Ambient +5°C to 95°C**
- **Unique Set and Forget™ technology - fast heat up, reliable temperature control**
- **Stability ±0.5°C**
- **Simple, intuitive controls - quick and easy to set temperature**
- **Drain tap on 12L, 18L and 26L baths**
- **Practical front panel lock - disables front panel controls preventing unintentional temperatures changes**
- **3 year warranty**
- **Suitable for use with heat transfer beads**



JBN12 model shown

Grant non-drip clear lid, included as standard – improves performance, limits evaporation and conserves energy

Base tray (included as standard) – promotes heat convection and optimal temperature uniformity, also allows any container to be placed directly in the bath

Front panel lock disables front panel controls preventing unintentional temperature changes

Clear, wide-angle viewing LED display - instant reassurance of bath status

Advanced dry run and run dry protection - prevents costly service repairs in case bath is accidentally switched on or run without water. Simply fill and restart

Fixed thermal cut-out - independent safety cut-out

User-calibration – single point for optimum accuracy at your working temperatures

Simple and intuitive controls for quick temperature setting – immediate temperature re-setting using and buttons

Drain tap – allows convenient emptying on 12L, 18L and 26L baths

Heater mat and sensor bonded to underside of tank – optimised uniformity and work space. Tank easy to clean

Markets: Education, industry

Applications: Practical science demonstration, sample warming, sample prep, QC materials, sample thawing, sample incubation, media preparation

JB Nova digital unstirred water bath range – summary of specifications

	General purpose unstirred baths – JB Nova			
	JBN5	JBN12	JBN18	JBN26
	3 kg h: 200 mm d: 215 mm w: 335 mm	6 kg h: 225 mm d: 380 mm w: 360 mm	9 kg h: 275 mm d: 590 mm w: 335 mm	9 kg h: 275 mm d: 590 mm w: 335 mm
Tank capacity	5L	12L	18L	26L
Temperature range	ambient +5 to 95°C			
Temp.display and setting resolution	0.5°C			
Temp stability (DIN 12876) @ 70°C	±0.5°C			
Temperature setting/energy regulation	digital			
Fixed thermal cut-out	●			
Dry start/run dry protection	●			
Working area l x w mm	131 x 281	281 x 306	485 x 281	481 x 278
Drain tap	–	●	●	●
Heater power 230V/120V kW	0.35/0.35	0.8/0.8	1.4/1.05	1.4/1.05
Supply voltage V	120 or 230			
	CE and CSA approved			

Options and accessories

	JBN5	JBN12	JBN18	JBN26
	5L	12L	18L	26L
	**Replacement polycarbonate transparent lids***			
	AQL5	**AQL12**	**AQL26**	**AQL26**
	Directs condensation away from immersed vessels, avoids contamination, reduces evaporation and saves energy			
	**Stainless steel sloping lids***			
	LU6	**LU14**	**LU28**	**LU28**
	**Flat lids***			
	LF6 (2 ring sets)	**LF14** (4 ring sets)	**LF28** (6 ring sets)	**LF28** (6 ring sets)
	With ring sets of variable hole diameter to accommodate tall vessels whilst reducing evaporation			
	**Polypropylene spheres*** (packs per bath)			
	1 x **PS20**	1 x **PS20**	2 x **PS20**	2 x **PS20**
	Useful alternative to a lid, minimises evaporation and heat loss whilst allowing easy access to vessels in the bath; particularly useful for tall vessels			
	**Raised shelves** – reversible, allows two shelf depths. h = shelf height above tank base (mm)			
	-	**RS14H** (h 40 or 78) shelf covers half area of JBN12	**RS18H** (h 40 or 135) shelf covers half area of JBN18	**RS28H** (h 45 or 135) shelf covers half area of JBN26
	**Racks** (no. per bath)			
	1 x **J2**	2 x **J2**	4 x **J2**	4 x **J2**
	Choice of 8 variants to accommodate different tube diameters and microtubes (see below)			
	**Replacement base trays**			
	AQBT5	**AQBT12**	**AQBT26**	**AQBT26**
	Required if flat-bottomed flasks are to be placed directly on the base of the bath and to promote thermal convection in the bath			
	**Drain stopper**			
	-	**UWB-DS** (pack of 5)	**UWB-DS** (pack of 5)	**UWB-DS** (pack of 5)
	Recommended when using heat transfer beads, to prevent beads entering drain hole			

* lid or spheres recommended for use above 60˚C

Unstirred Bath Racks

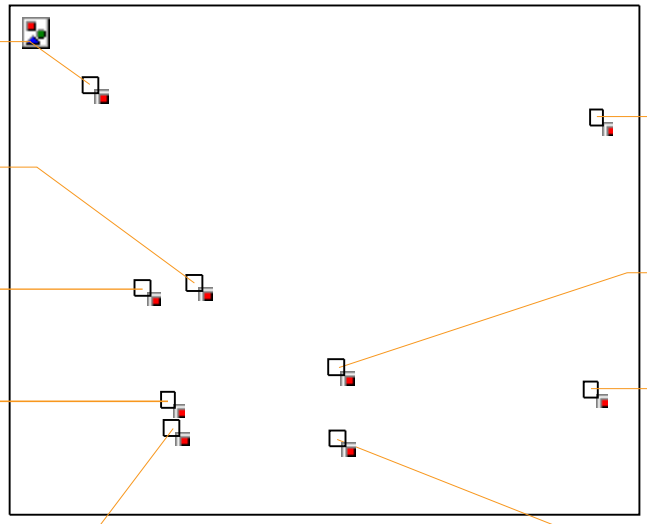
J2 Racks	Tube size Ø	Capacity	J2 Racks	Tube size Ø	Capacity
J2-10	10 mm	84	J2-25	25 mm	18
J2-13	13 mm	55	J2-30	30 mm	12
J2-16	16 mm	36	J2-SE	0.5 ml	105
J2-19	19 mm	32	J2-LE	1.5 ml	65

Basic digital water bath range – JB Academy

An ideal choice for schools and colleges requiring a basic simple-to-use quality water bath. Base tray included as standard. A great value range consisting of three models - 5L, 12L and 18L.

- **Ambient +5°C to 95°C**
- **Unique Set and Forget™ technology - fast heat-up, reliable temperature control**
- **Stability ±0.5°C**
- **Simple, intuitive controls - quick and easy to set temperature**
- **Practical front panel lock - disables front panel controls preventing unintentional temperature changes**
- **3 year warranty**

JBA12 model shown



Stainless steel tank – high grade steel, with durable polished finish

User calibration – single point for optimum accuracy at your working temperatures

Simple and intuitive controls for quick temperature setting – immediate temperature re-setting using and buttons

Clear, wide-angle viewing LED display - instant reassurance of bath status

Fixed thermal cut-out independent safety feature

Grant polycarbonate perforated base tray (included as standard) – promotes heat convection and optimal temperature uniformity, also allows any container to be placed directly in the bath

Front panel lock disables front panel controls preventing unintentional temperature changes

Heater mat and sensor bonded to underside of tank – optimised uniformity and work space. Tank easy to clean

Advanced dry run and run dry protection - prevents costly service repairs in case bath is accidentally switched on or run without water. Simply fill and restart

Markets: Education, schools, colleges and industry

Applications: Practical science demonstration, sample warming, media preparation

JB Academy digital unstirred water bath range – summary of specifications

	Basic unstirred baths – JB Academy		
	JBA5	JBA12	JBA18
	3 kg h: 200 mm d: 215 mm w: 335 mm	6 kg h: 225 mm d: 365 mm w: 360 mm	9 kg h: 275 mm d: 570 mm w: 335 mm
Tank capacity	5L	12L	18L
Temperature range	ambient + 5 to 95°C		
Temp.display and setting resolution	0.5°C		
Temp stability (DIN 12876) @ 70°C	±0.5°C		
Temperature setting/energy regulation	digital		
Fixed thermal cut-out	●		
Dry start/run dry protection	●		
Working area l x w mm	131 x 281	281 x 306	485 x 281
Heater power 230V/120V kW	0.35/0.35	0.8/0.8	1.4/1.05
Supply voltage V	120 or 230		
	CE and CSA approved		

Options and accessories

	JBA5	JBA12	JBA18
	5L	12L	18L
	**Polycarbonate transparent lids***		
	AQL5	**AQL12**	**AQL26**
	Directs condensation away from immersed vessels, avoids contamination, reduces evaporation and saves energy		
	**Stainless steel sloping lids***		
	LU6	**LU14**	**LU28**
	**Flat lids***		
	LF6 (2 ring sets)	**LF14** (4 ring sets)	**LF28** (6 ring sets)
	With ring sets of variable hole diameter to accommodate tall vessels whilst reducing evaporation		
	**Polypropylene spheres*** (pack per bath)		
	1 x **PS20**	1 x **PS20**	2 x **PS20**
	Useful alternative to a lid, minimises evaporation and heat loss whilst allowing easy access to vessels in the bath; particularly useful for tall vessels		
	**Raised shelves** – reversible, allo s two shelf depths. h = shelf height above tank base (mm)		
	–	**RS14H** (h 40 or 78) shelf covers half area of JBA12	**RS18H** (h 40 or 135) shelf covers half area of JBA18
	**Racks** (no. per bath)		
	1 x **J2**	2 x **J2**	4 x **J2**
	Choice of 8 variants to accommoda different tube diameters and microtubes (see below)		
	**Replacement base trays**		
	AQBT5	**AQBT12**	**AQBT26**
	Required if flat-bottomed flasks are to be placed directly on the base of the bath and to promote thermal convection in the bath		

* lid or spheres recommended to be used above 60˚C

Unstirred Bath Racks

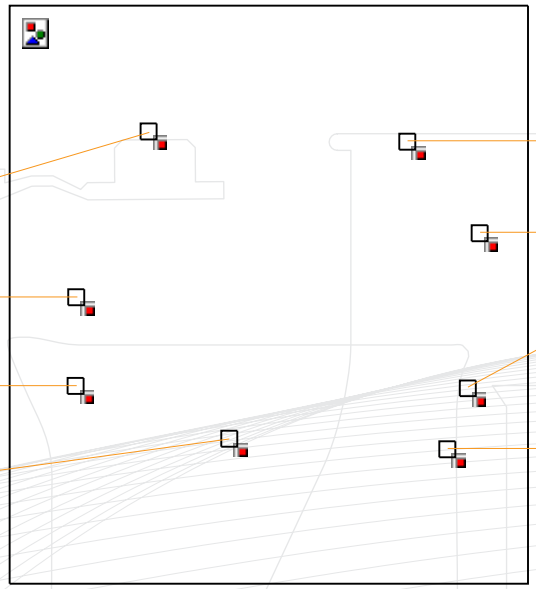
J2 Racks	Tube size Ø	Capacity	J2 Racks	Tube size Ø	Capacity
J2-10	10 mm	84	J2-25	25 mm	18
J2-13	13 mm	55	J2-30	30 mm	12
J2-16	16 mm	36	J2-SE	0.5 ml	105
J2-19	19 mm	32	J2-LE	1.5 ml	65

Boiling baths – SBB Aqua Plus series

The SBB Aqua Plus boiling baths are robust and reliable and provide continuous 100°C operation. The range consists of four models to suit a range of applications and any budget.

- **Adjustable energy regulator provides steady boiling**
- **Constant level device maintains liquid level**
- **Robust and reliable design to withstand everyday wear and tear**
- **Choice of sizes to suit individual applications**
- **Grant non-drip polycarbonate lid included as standard**
- **3 year warranty**

3 year warranty



SBB Aqua 12 Plus model shown

Grant non-drip polycarbonate lid included – improves performance, limits evaporation and conserves energy

Large available working area in relation to footprint

Stainless steel tank in a robust outer case – tough and durable in demanding environments

Adjustable energy regulator provides steady boiling

Range of tank sizes and options to suit different requirements

Constant level device maintains the required liquid level for optimal operation

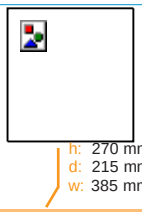
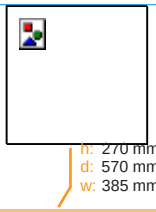
Two over temperature cut-outs protect users and the workplace if bath is accidentally run without liquid

Supplied with perforated tray to ensure uniform heat distribution

Applications:

- Clinical, Microbiology and Pathology labs - media preparation
- University Research/Teaching - tissue culture preparation, warming tissue culture media
- Industrial Laboratories - equipment sanitisation, sample preparation for immuno assays
- Science Education in schools/universities - practical science demonstration and experimentation

SBB boiling baths range summary of specifications

			Boiling baths – SBB Aqua Plus series			
			SBB Aqua 5 Plus	SBB Aqua 12 Plus	SBB Aqua 18 Plus	SBB Aqua 26 Plus
			 h: 270 mm d: 215 mm w: 385 mm	 h: 270 mm d: 390 mm w: 385 mm	 h: 270 mm d: 570 mm w: 385 mm	 h: 300 mm d: 570 mm w: 385 mm
Tank capacity			5L	12L	18L	26L
Temperature range		°C	100 only			
Temperature setting/energy regulation			analogue			
Working volume	l/w/d	mm	145/290/105	315/290/105	495/290/105	495/290/155
Heater power/overall consumption,		120 V / 230 V	1.3/1.5 kW	1.35/1.5 kW	1.35/2.0 kW	1.35/2.0 kW
Supply voltage		V	120 or 230			
Safety		temperature	two fixed cut-outs			

Options and accessories

	SBB Aqua 5 Plus	SBB Aqua 12 Plus	SBB Aqua 18 Plus	SBB Aqua 26 Plus
Replacement transparent polycarbonate lids				
	AQL5	**AQL12**	**AQL18**	**AQL26**
Directs condensation away from immersed vessels, avoids contamination, reduces evaporation and saves energy				
Stainless steel sloping lids				
	LU6	**LU14**	**LU28**	**LU28**
Flat lids				
	LF6 (2 ring sets)	**LF14** (4 ring sets)	**LF28** (6 rings sets)	**LF28** (6 rings sets)
With ring sets of variable hole diameter to accommodate tall vessels whilst reducing evaporation				
Polypropylene spheres (packs per bath)				
	1 x **PS20**	1 x **PS20**	2 x **PS20**	2 x **PS20**
Useful alternative to a lid, minimises evaporation and heat loss whilst allowing easy access to vessels in the bath; particularly useful for tall vessels				
Raised shelves – reversible, allows two shelf depths. h = shelf height above tank base (mm)				
	–	**RS14H** (h 40 or 78) shelf covers half area of SBB Aqua 12 Plus	**RS18H** (h 40 or 135) shelf covers half area of SBB Aqua 18 Plus	**RS28H** (h 45 or 135) shelf covers half area of SBB Aqua 26 Plus
Racks (no. per bath)				
	1 x **J2**	2 x **J2**	4 x **J2**	4 x **J2**
Choice of 8 variants to accommodate different tube diameters and microtubes (see below)				
Replacement base trays				
	SBT6	**SBT14**	**SBT28**	**SBT28**
Required if flat-bottomed flasks are to be placed directly on the base of the bath and to promote thermal convection in the bath				

Unstirred Bath Racks

J2 Racks	Tube size ø	Capacity	J2 Racks	Tube size ø	Capacity
J2-10	10 mm	84	J2-25	25 mm	18
J2-13	13 mm	55	J2-30	30 mm	12
J2-16	16 mm	36	J2-SE	0.5 ml	105
J2-19	19 mm	32	J2-LE	1.5 ml	65

5 Shaking water baths

OLS26 Aqua Pro Orbital / Linear shaking bath

Offering ultimate flexibility and usability for all applications

LSB12 & LSB18 Aqua Pro Linear shaking water baths

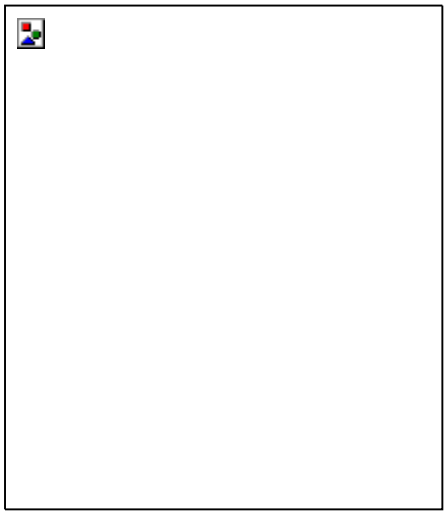
Excellent usability for routine applications

Shaking water baths

World-renowned shaking water baths from Grant: high precision temperature control combined with a robust, high quality, patented orbital and linear shaking mechanism that works smoothly and consistently even in demanding applications.

- High quality, robust design with unique magnetically coupled shaking mechanism for maximum reliability, consistency and quiet operation
- Flexible choice of combined orbital / linear shaking or linear only shaking for all routine and demanding techniques
- Extensive range of accessories to provide the right solution for your application. Varied vessels types can be securely held using high quality, springs, clamps or racks

3 year warranty



Combined orbital/linear shaking bath OLS26
For ultimate flexibility and usability

LSB12 and LSB18
Excellent usuablilty for all routine applications

Liquids

We recommend the following liquids for use in Grant shaking water baths:

5°C to 99°C: Water

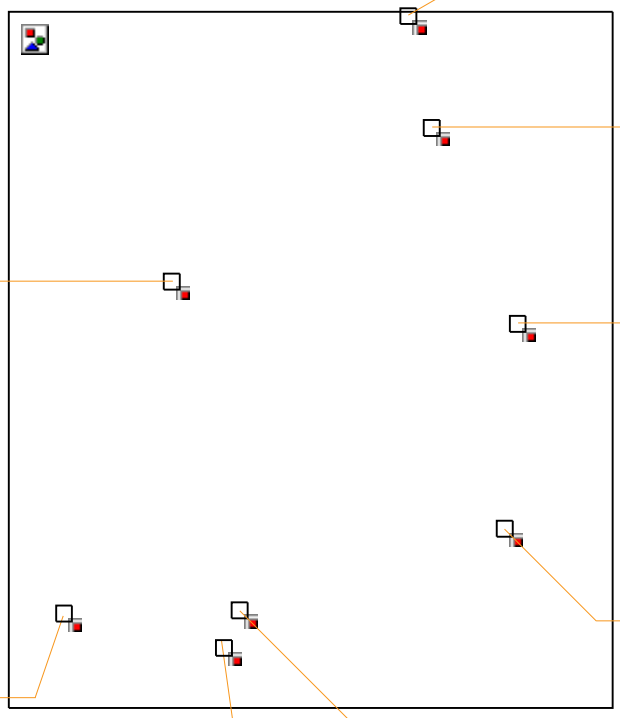
Combined orbital/linear shaking bath

Model OLS26 Amb +5°C to 99°C. Extend lower range to 0°C using accessory cooling. Stability ±0.1°C

Patented, combined orbital and linear shaking mechanism of the OLS26 allows optimisation of aeration and shear forces mixing, for reproducible results.

- **Precision digital temperature control**
- **0°C to 99°C operating range***
- **Stability ±0.1°C**
- **Easy changeover from linear to orbital shaking**
- **Adjustable shaking speed and stroke length**
- **Polycarbonate lid included as standard**
- **Drain tap for convenient emptying**
- **3 year warranty**
- **For flexibility, tray sold seperately**

OLS26 model shown



Tray sold seperately. Three options:
Universal tray- with adjustable springs
Flask tray - mix and match flask clamps
Test tube / microtube tray - extensive choice of racks available

Universal tray flask capacity: 3 x 1000ml, 6 x 500ml, 18 x 100ml, 28 x 50ml, 45 x 25ml

Powerful drive mechanism - soft start, quiet operation for smooth shaking over a wide speed range

Can be operated below ambient to 0°C with accessory cooling - CC26

Unique shaking mechanism allows orbital and linear shaking in one product - simply rotate the tray carrier 180° to change between modes.

Grant non-drip polycarbonate lid included as standard - improves performance, limits evaporation and conserves energy

Front panel lock - disables front panel controls preventing settings being accidentally changed

User calibration - single or dual for optimum accuracy at your working tempeature

Digital PID temperature control circuitry – with sensitive Pt1000 temperature control probe

Conveniently located drain tap for easy emptying

Heater and temperature sensor mounted under tank - large available working area; easy to clean and keep clean

User defined high-temp alarm and cut-out - provides sample protection

Countdown timer with audible alarm - for accurate reaction timing (1-999 mins)

Individual displays / controls for temperature and shaking speed

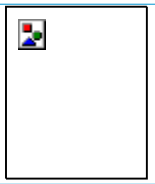
Two adjustable temperature and shaking speed presets

* accessory cooling required for operation below ambient

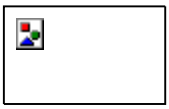
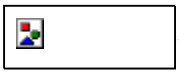
Applications:

- General use - defrosting, cooling/warming liquids, temperature control of samples
- Life-science - microbiological assays, tissue studies, cell cultivation fermentation, bacterial culture, biochemical assays, enzyme assay
- Industrial - materials testing, corrosion testing
- Biopharm - solubility testing of medical coatings, dissolution, cooling crystallisation
- Food & beverage - extractions, food digestion

OLS26 Shaking water bath – summary of specifications

	Orbital/linear shaking bath OLS26
	 13.8 kg h: 325 mm d: 565 mm w: 335 mm
Tank size	26L
Minimum working depth	70 mm
Temperature range	ambient +5 to 99°C. 0 to 99°C with accessory cooling
Uniformity (DIN 12876-3) @ 70°C	±0.1°C
Stability (DIN 12876-3) @ 70°C	±0.1°C
Display	2 x LED (individual displays and controls for temperature and shaking speed)
Orbital and Linear shaking speed	20 to 200 rpm (depending on load)
Orbital shaking radius	9 mm
Shaking speed display resolution	1 rpm
Linear shaking stroke length	18, 28, and 36 mm
Shaking tray area	380 x 235 mm
Timer	1 to 999 mins
Heater power 120V / 230V	1.05 / 1.4 kW
Drain tap	yes
Safety	over temperature protection / low liquid level cut-out
Supply voltage	110-120V or 220-230V

Accessories

	Universal tray - with adjustable springs. Highly versatile for a variety of vessel types.	**Universal tray** TU26
	Flask / plate tray - with threaded holes to accept flask clamps or holder for deep well plates (≥2ml). See options below.	**Flask / plate tray** TF26
	Test tube tray - compatible with SR racks or can be used alone to accommodate bags and miscellaneous vessels. See rack options below.	**Test tube tray** TS26 (holds up to 5 SR racks)
	Base tray - stainless steel perforated allows bath to be used as an unstirred bath.	**Base tray** SBT26
	Cooling coil - source of constant cooling to enable bath to be operated at or below ambient, down to 0°C.	**Immersion cooler** CC26
	Heat exchange coil - can be attached to a cold water supply or refrigerated circulator. Can be used down to 2°C above the temperature of the coolant.	**Heat exchange coil** CW26
	With access hole for cooling coil	**Stainless steal sloping lid (optional)** LS200
		**Replacement polycarbonate lid (unsuitable for use with cooling coil)** AQL26

Flask clamps and plate holder

Part Number	Description	OLS26 Capacity
SC-25	for 25ml flask	28
SC-50	for 50ml flask	24
SC-100	for 100ml flask	15
SC-250	for 250ml flask	8
SC-500	for 500ml flask	6
SC-1000	for 1000ml flask	3
SH-DWP	1 x deep well plate	4

Test tube racks / microtube racks

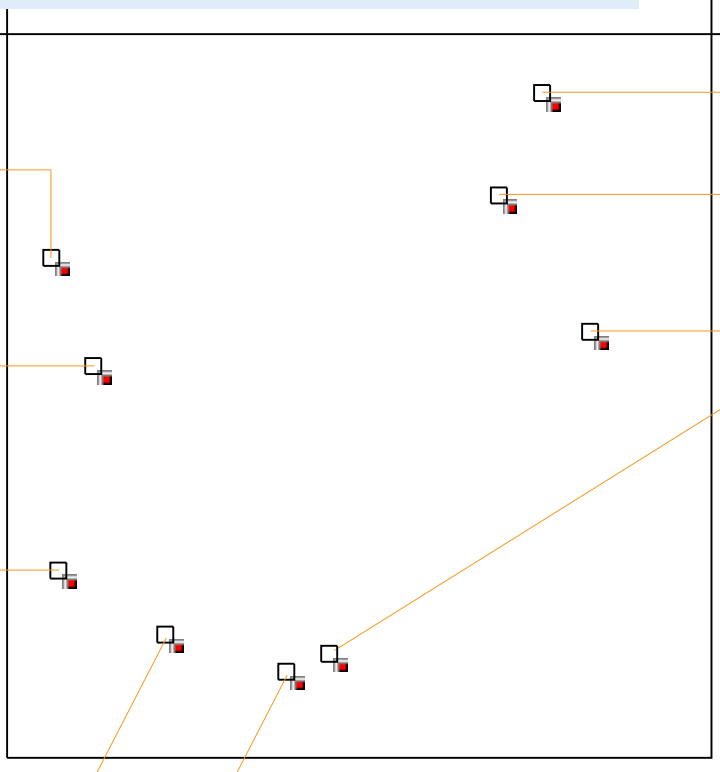
Part Number	Tube diameter (mm)	Rack capacity
SR-10	10	48
SR-13	13	44
SR-16	16	24
SR-19	19	21
SR-25	25	12
SR-30	30	10
Part Number	**Microtube size (ml)**	**Rack capacity**
SR-SE	0.5	119
SR-LE	1.5	48

Linear shaking bath – LSB Aqua Pro range

Grant quality and design combined with the temperature stability and functions you need in a linear shaking bath for your laboratory.

- **Ambient +5˚C to 99˚C operation**
- **Stability ±0.1˚C**
- **Choice of two models – 12 and 18 litre**
- **Drain tap for convenient emptying**
- **3 year warranty**
- **Polycarbonate lid included**
- **Extensive choice of accessory shaking trays. Tray sold seperately**

LSB12 model shown



Stainless steel tank – high grade steel, with durable polished finish

Robust magnetically coupled shaking mechanism – safe, reliable, durable, space saving

User settable over temperature alarm – provides sample protection. Alerts user and cut of heating at user defined temperature

Drain tap – allows convenient emptying

Heater mat and sensor bonded to underside of tank – optimises temperature uniformity, workspace and is easy to clean

Two programmable temperature and shaking presets – allows commonly used temperatures and shaking speeds to be quickly selected

Grant non-drip polycarbonate lid included as standard – improves performance, limits evaporation and conserves energy

Unique shaking mechanism - soft start, quiet operation for smooth shaking over a wide speed range

Digital PID temperature control circuitry – with sensitive Pt1000 temperature control probe

Clear, wide-angle viewing LED display

Tray sold seperately. Three options:
Universal tray- with adjustable springs
Flask tray - mix and match flask clamps
Test tube / microtube tray
- extensive choice of racks available

Countdown timer with audible alarm – for accurate reaction timing (1-999mins)

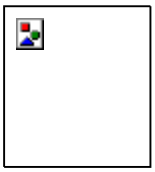
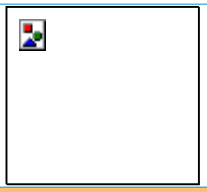
User-calibration – single or dual-point for optimum accuracy at your working temperature

Front panel lock – disables front panel controls preventing settings being accidentally changed

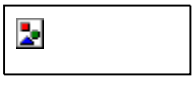
Applications:

- Clinical/Healthcare - thawing/mixing samples
- Pharmaceutical - heating and mixing samples
- Science education in schools/universities - practical science demonstration and experimentation
- Industrial - QC testing, sample preparation

LSB shaking water baths – summary of specifications

	Linear shaking bath	
	LSB12	LSB18
	 9.2 kg h: 275 mm d: 360 mm w: 335 mm	 11.2 kg h: 275 mm d: 565 mm w: 335 mm
Tank size	12L	18L
Minimum working depth	60 mm	
Temperature range	ambient +5 to 99°C	
Uniformity (DIN 12876-3) @ 70°C	±0.1°C	
Stability (DIN 12876-3) @ 70°C	±0.1°C	
Display	LED	
Linear shaking speed	20 to 200 rpm (depending on load)	
Shaking speed display resolution	1 rpm	
Linear shaking stroke length	20 mm	
Shaking tray area	240 x 235 mm	420 x 235 mm
Timer	1 to 999 mins	
Heater power 120 / 230V	0.8/0.8 kW	1.05/1.4 kW
Drain tap	yes	
Safety	over-temperature protection / low liquid cut-out	
Supply voltage	110-120V or 220-230V	

Accessories

	LSB12	LSB18
 Universal tray - with adjustable springs. Highly versatile for a variety of vessel types.	**Universal tray**	
	TU12	TU18
 Flask / plate tray - with threaded holes to accept flask clamps or holder for deep well plates (≥2ml). See options below.	**Flask / plate tray**	
	TF12	TF18
 Test tube tray - compatible with SR racks or can be used alone to accommodate bags and miscellaneous vessels. See rack options below.	**Test tube tray**	
	TS12 (holds up to 3 SR racks)	TS18 (holds up to 5 SR racks)
 Base tray - stainless steel perforated allows bath to be used as an unstirred bath.	**Base tray**	
	SBT12	SBT26
	**Stainless steal sloping lid**	
	LU14	LU28
	**Replacement polycarbonate lid**	
	AQL12	AQL26

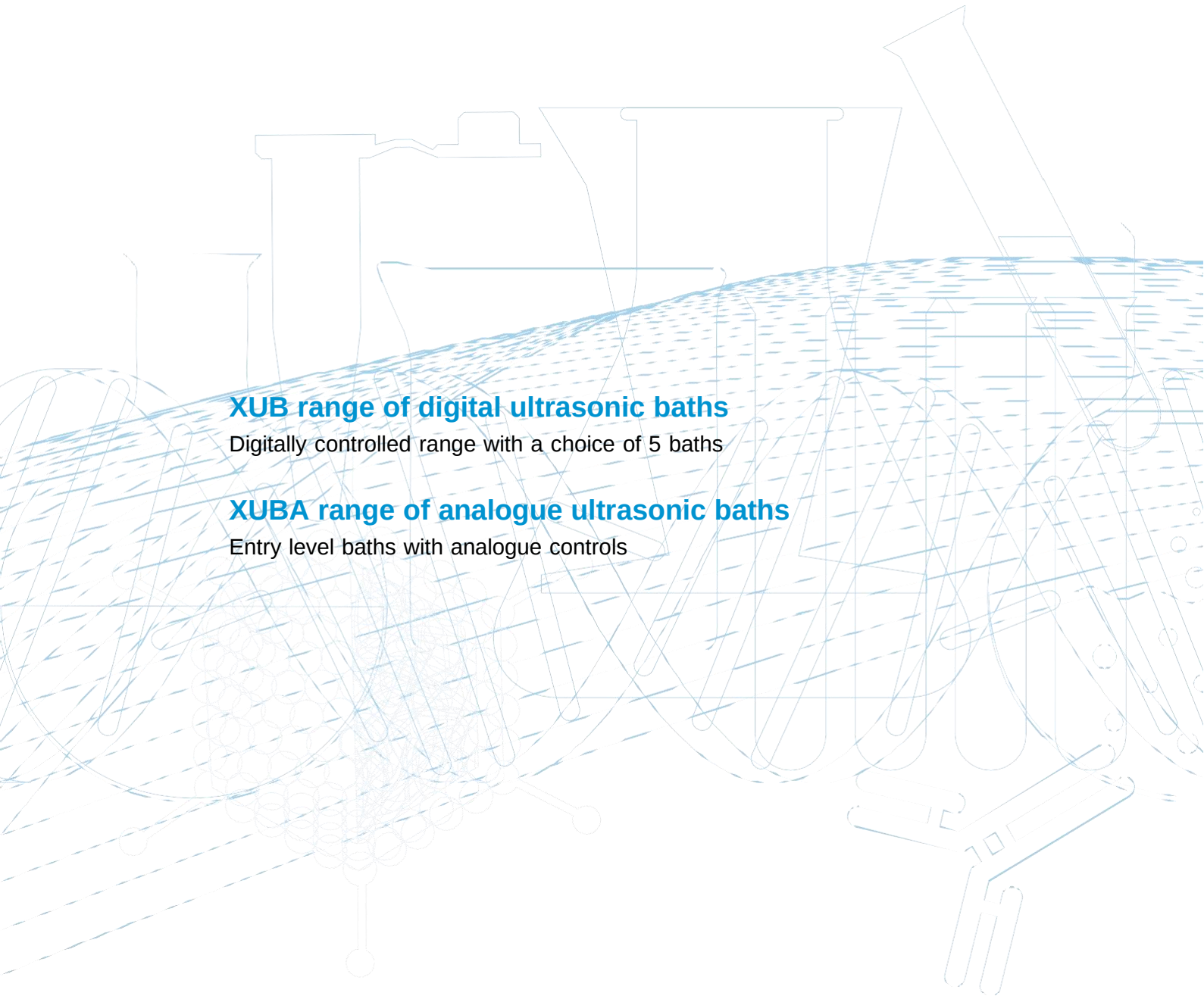
Flask clamps and plate holder

Part Number	Description	LSB12 Capacity	LSB18 Capacity
SC-25	for 25ml flask	20	35
SC-50	for 50ml flask	16	28
SC-100	for 100ml flask	16	28
SC-250	for 250ml flask	9	15
SC-500	for 500ml flask	6	8
SC-1000	for 1000ml flask	4	6
SH-DWP	1 x deep well plate	1	4

Test tube racks / microtube racks

Part Number	Tube diameter (mm)	Rack capacity
SR-10	10	48
SR-13	13	44
SR-16	16	24
SR-19	19	21
SR-25	25	12
SR-30	30	10
Part Number	Microtube size (ml)	Rack capacity
SR-SE	0.5	119
SR-LE	1.5	48

6 Ultrasonic baths



XUB range of digital ultrasonic baths

Digitally controlled range with a choice of 5 baths

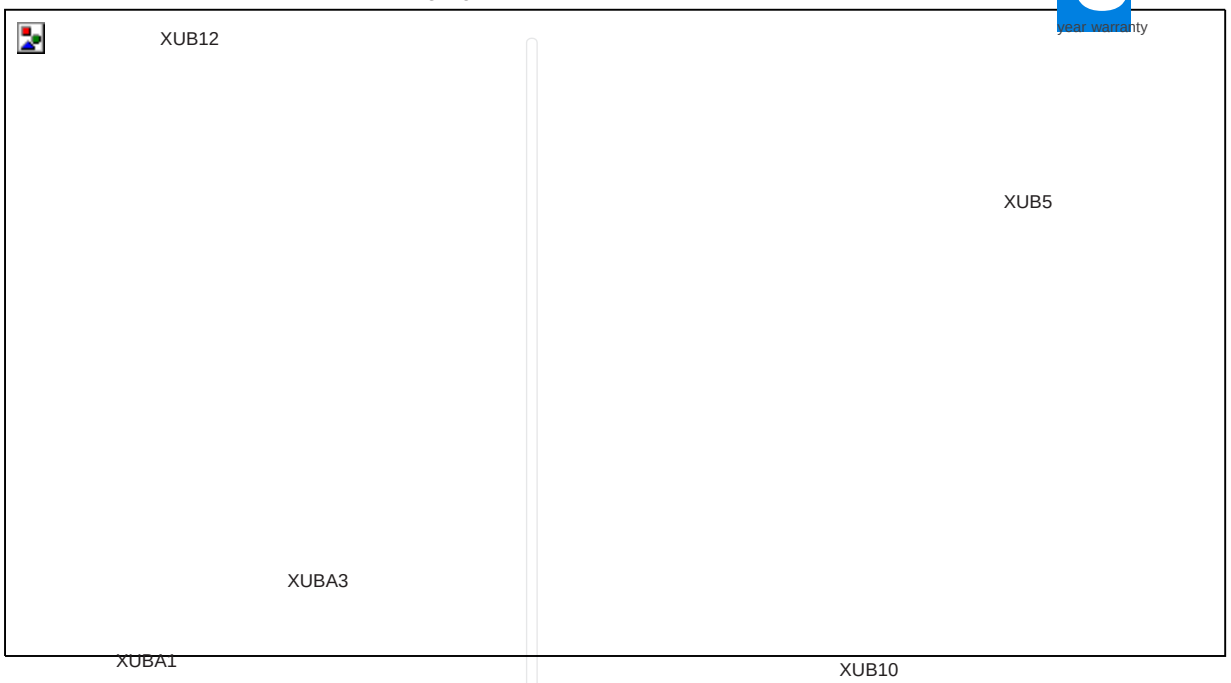
XUBA range of analogue ultrasonic baths

Entry level baths with analogue controls

Ultrasonic baths

The XUBA and XUB series of reliable, high-performance ultrasonic baths offer fast, safe and cost-effective consistent ultrasonics for various scientific and laboratory applications.

- Innovative transducer technology provides outstanding performance and reliability
- Gentle yet effective cleaning ensuring consistent results for rapid and complete removal of contaminants
- Suitable for sophisticated applications in the scientific sector such as degassing, sonochemistry and fluid dissolution
- Clean finish, high-quality and robust design for long-term reliability and durability.
- A choice of five digital and two analogue models (XUBA's available in 230V versions only)



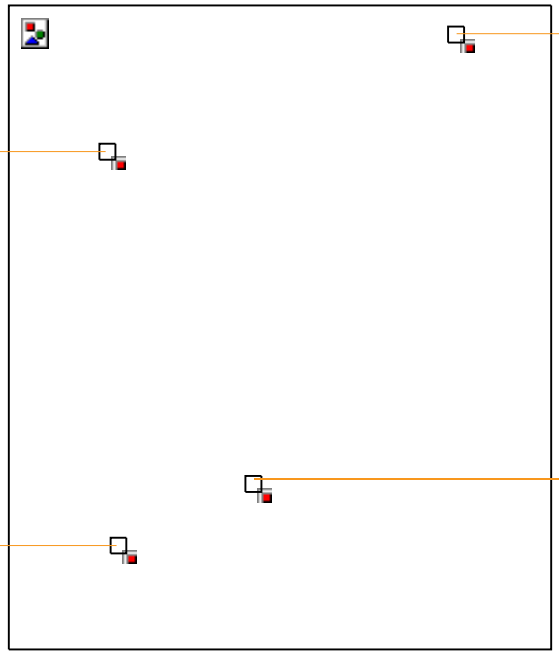
The XUB and XUBA range of baths are ideal for cleaning a wide range of laboratory instruments as well as in other healthcare, medical and industrial applications. The ultrasonic activity generated in the baths allows rapid and effective cleaning and processing of a wide range of instruments and components – a safer alternative to manual operations.

XUB digital ultrasonic baths

The XUB range of digitally controlled benchtop ultrasonic baths offer consistent and reliable performance in a variety of environments. Incorporating Frequency LEAP technology to ensure uniform levels of ultrasonic activity throughout the fluid, these baths offer high performance giving an accurate and precise ultrasonic process.

- **Frequency LEAP technology provides more homogeneous ultrasonic activity throughout the tank, reducing dead spots and standing waves**
- **Heated from ambient +5˚C to 70˚C**
- **Accurate process control of time, temperature, ultrasonic activity, degas and power**
- **Modern, sleek design with stainless steel basket, ABS plastic lid, M2 ultrasonic cleaning solution, SD card and drain tap included as standard**
- **Degassing function to remove small bubbles from liquid, reducing the overall time needed for ultrasonic operation**
- **A choice of 5 sizes**
- **Adjustable power that can be reduced from 100 to 50% in 5% increments**

Example: **XUB12**



Stainless steel basket designed specifically to generate maximum ultrasonic activity, prevent items resting on the tank and prevent operators coming into contact with chemical solutions

Stainless steel basket, ergonomic lid, SD card and one bottle of M2 Ultrasonic solution included as standard

SD port allows easy validation tracking between XUB series and PC

Improved software memory logs cleaning parameters allowing easy cycle repeatability

Easy traceability of cycle number, time, temperature and sonics validation

Lid and basket forms a drip collection unit, minimising flow of contaminated liquid once cycle is finished

Easy to use single touch LCD control panel with user-settable parameters to suit the individual requirements

Intelligent software remembers last cycle cleaning setting

Accurate fluid level sensors to ensure bath is not under-filled prior to or during the cycle

Drain valve for convenient emptying – located at the rear of the unit

Applications:

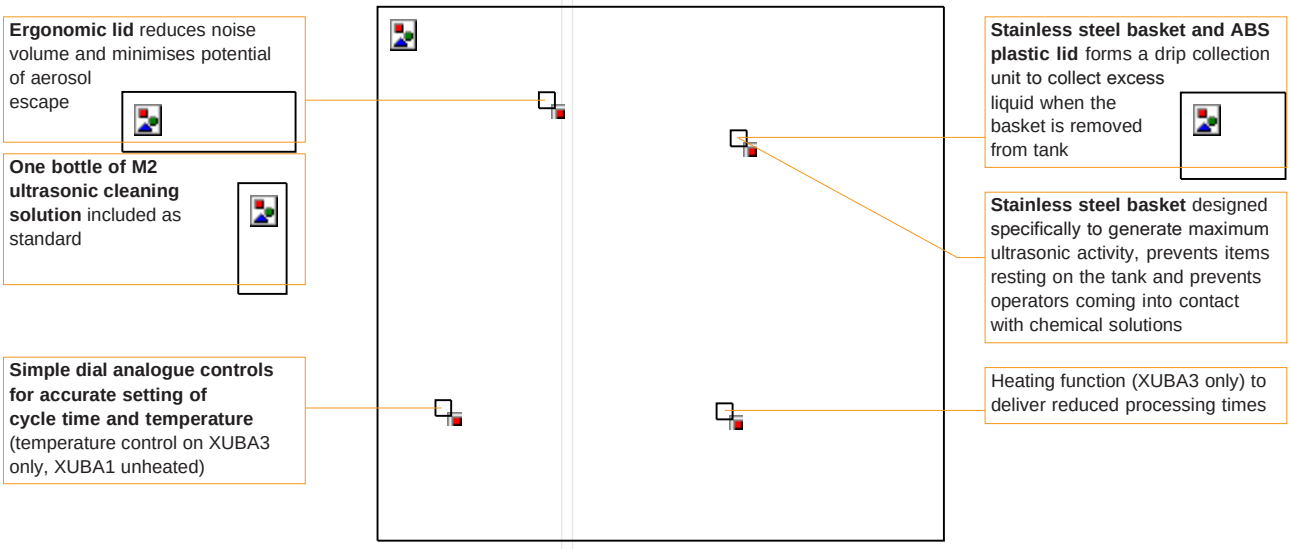
- Healthcare/clinical - the first stage of the decontamination process for reusable surgical instruments in dental, podiatry and general practice settings
- General use - glass, equipment, component cleaning, sonication of cytometer nozzles, dispersion and solubulisation
- Laboratories - cleaning of components, degassing fluids, mixing fluids and compounds, cell disruption, fluid dissolution
- Industrial - light manufacturing
- HPLC - degassing of solvents pre analyses
- Biopharm - dissolution of samples

XUBA entry level ultrasonic baths

Compact analogue controlled range of ultrasonic baths providing a high standard of reliable and effective ultrasonic technology. The choice of two baths come in a great value-for-money package, with M2 cleaning solution, stainless steel basket and ABS plastic lid included as standard (Available in 230V versions only).

- **Excellent entry level ultrasonic bath**
- **Fast, effective, efficient, easy and safe cleaning and processing of diverse instruments, components and solutions**
- **Supplied with stainless steel basket and ABS plastic lid as standard**
- **One bottle of M2 ultrasonic cleaning solution included as standard**
- **Robust design offers outstanding durability and reliability**
- **Control panel easy to operate even when wearing gloves**
- **Time control from 0-15 minutes on both baths**
- **Ambient +5˚C to 70˚C heating on the XUBA3**

Example: **XUBA3**



Applications:

- Healthcare/Clinical - the first stage of the decontamination process for reusable surgical instruments in dental, podiatry and general practice settings.
- General use - glass, equipment, component cleaning, sonication of cytometer nozzles, dispersion and solubulisation
- Laboratories - cleaning of components, degassing fluids, mixing fluids and compounds, cell disruption, fluid dissolution
- Industrial - light manufacturing
- Biopharm - dissolution of samples

XUB and XUBA ultrasonic water baths range – models and specifications

● = standard
⌋ = bath dimensions with lid
Weight = net weight bath only

		Digital					Analogue	
		XUB5	XUB10	XUB12	XUB18	XUB25	XUBA1	XUBA3
		 h: 267 mm d: 200 mm w: 345 mm weight: 5.6kg	 h: 267 mm d: 183 mm w: 550 mm weight: 7.7kg	 h: 366 mm d: 288 mm w: 345 mm weight: 8.4kg	 h: 366 mm d: 347 mm w: 374 mm weight: 10.2kg	 h: 366 mm d: 347 mm w: 551 mm weight: 13.3kg	 h: 195 mm d: 180 mm w: 197 mm weight: 2.0kg	 h: 195 mm d: 180 mm w: 275 mm weight: 2.9kg
Working capacity		4.5L	9.5L	12.5L	17.5L	25L	1.5L	2.5L
Max capacity		5L	10.5L	14L	18.5L	28L	1.75L	2.75L
Ultrasonic power	W	100	200	200	300	400	35	35
	per litre/W	22.2	21	16	17	16	23.3	14
Operating frequency	KHz	32-38					44	
Frequency LEAP		●	●	●	●	●	–	–
Heated		●	●	●	●	●	–	●
Digital LCD controls		●	●	●	●	●	–	–
SD port with SD card		●	●	●	●	●	–	–
Maximum heating capacity	˚C	ambient +5 to 70					N/A	ambient +5 to 70
Heater power	W	150	250	250	450	500	N/A	150
Timer	mins	0-99					0-15	0-15
Drain outlet BSP valve		3/8”					N/A	N/A
Supply voltage	V	110 or 230					230 only	

Options and accessories

Replacement ABS lid

Reduce operating noise and potential escape of aerosols (supplied as standard with the baths)		XAL5	XAL10	XAL12	XAL18	XAL25	XAL1	XAL3

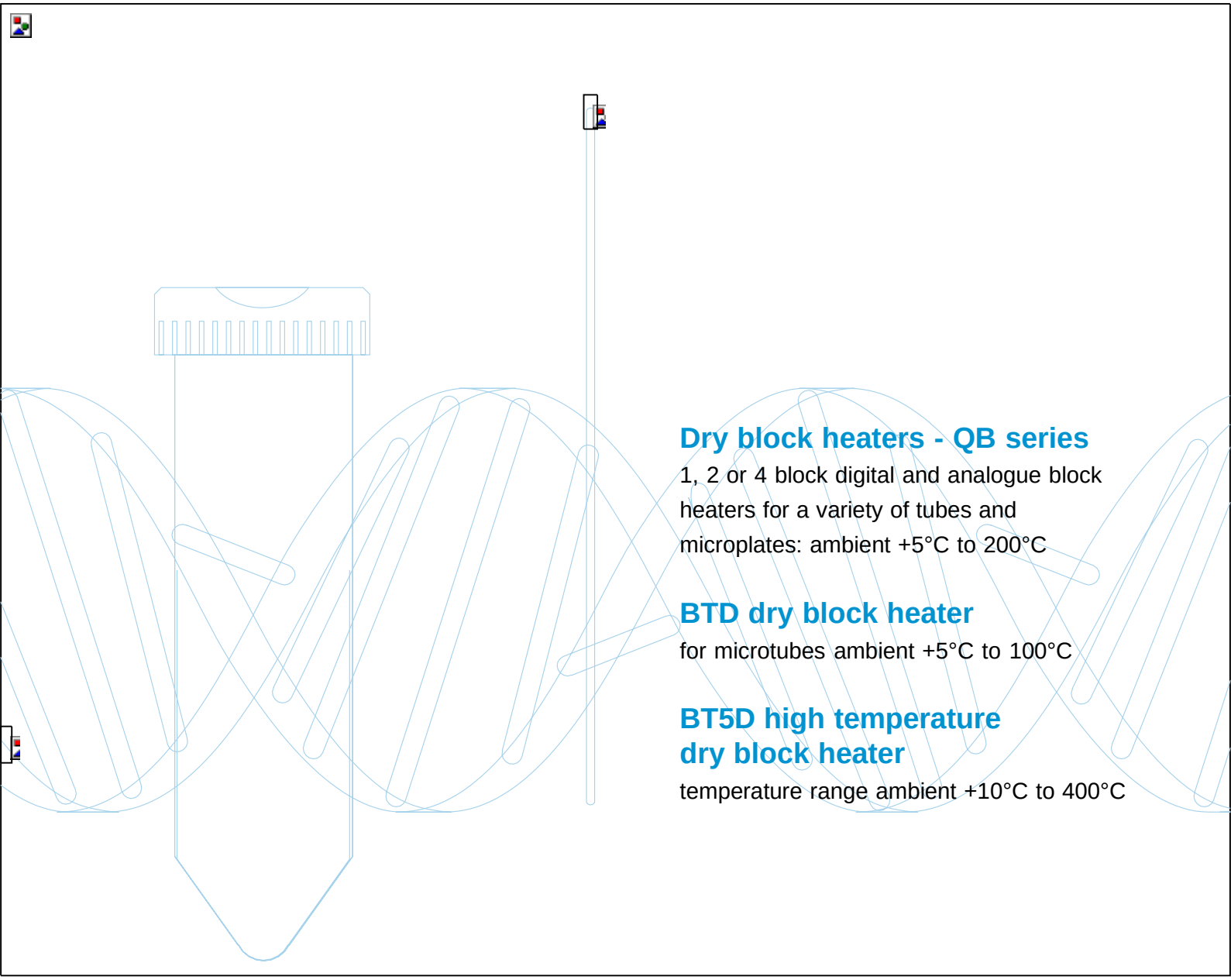
Replacement baskets

Support the items to be processed and work with the lid as a drip collection unit (supplied as standard with the baths)		XAB5	XAB10	XAB12	XAB18	XAB25	XAB1	XAB3
Internal basket dimensions including handle	w/d/h mm	265 x 120 x 140	467 x 100 x 115	263 x 203 x 193	295 x 267 x 160	463 x 263 x 159	115 x 95 x 87	208 x 115 x 98

Ultrasonic solution

General purpose detergent for use with ultrasonic baths. Pack of 6 x 1L bottles		M2 Sol	M2 Sol	M2 Sol	M2 Sol	M2 Sol	M2 Sol	M2 Sol

7 Dry block heaters



Dry block heaters - QB series

1, 2 or 4 block digital and analogue block heaters for a variety of tubes and microplates: ambient +5°C to 200°C

BTD dry block heater

for microtubes ambient +5°C to 100°C

BT5D high temperature dry block heater

temperature range ambient +10°C to 400°C

QB Dry block heating systems

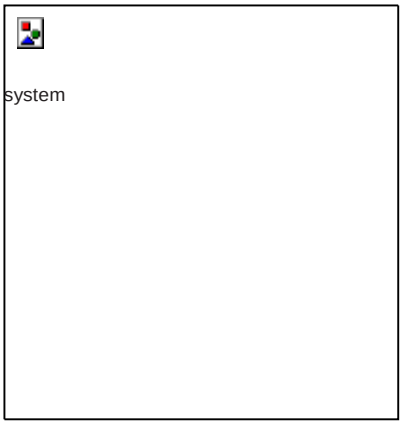
for test tubes, microtubes and microplates ambient +5°C to 200°C

Dry block heating systems combining superb temperature control and uniformity with high quality design and great versatility. A premium product range at an affordable price.

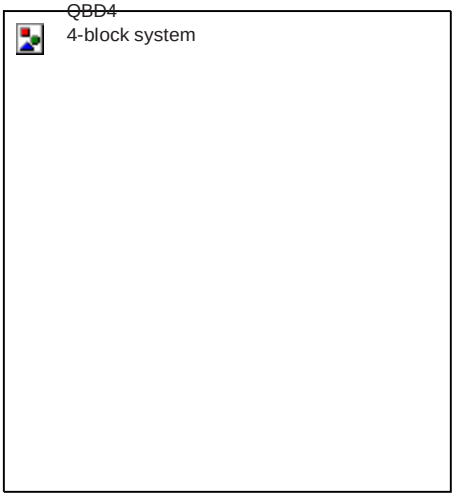
- Accurate, reproducible, rapid and safe heating of your samples – due to advanced temperature control combined with high quality, precision-engineered blocks providing excellent thermal contact
- Versatile range of interchangeable heating blocks to fit any sample tube or plate – from our standard range of blocks, or custom-made blocks to suit your application
- Full range of models and options for basic through to more sophisticated applications

3 year warranty

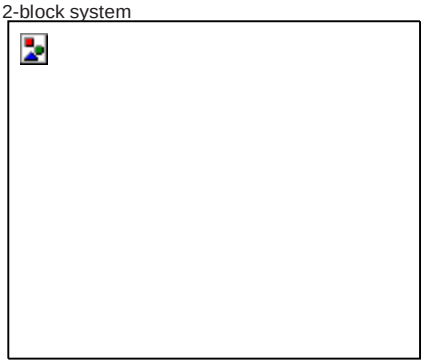
QBD1
1-block system



QBD4
4-block system



QBD2
2-block system



Applications:

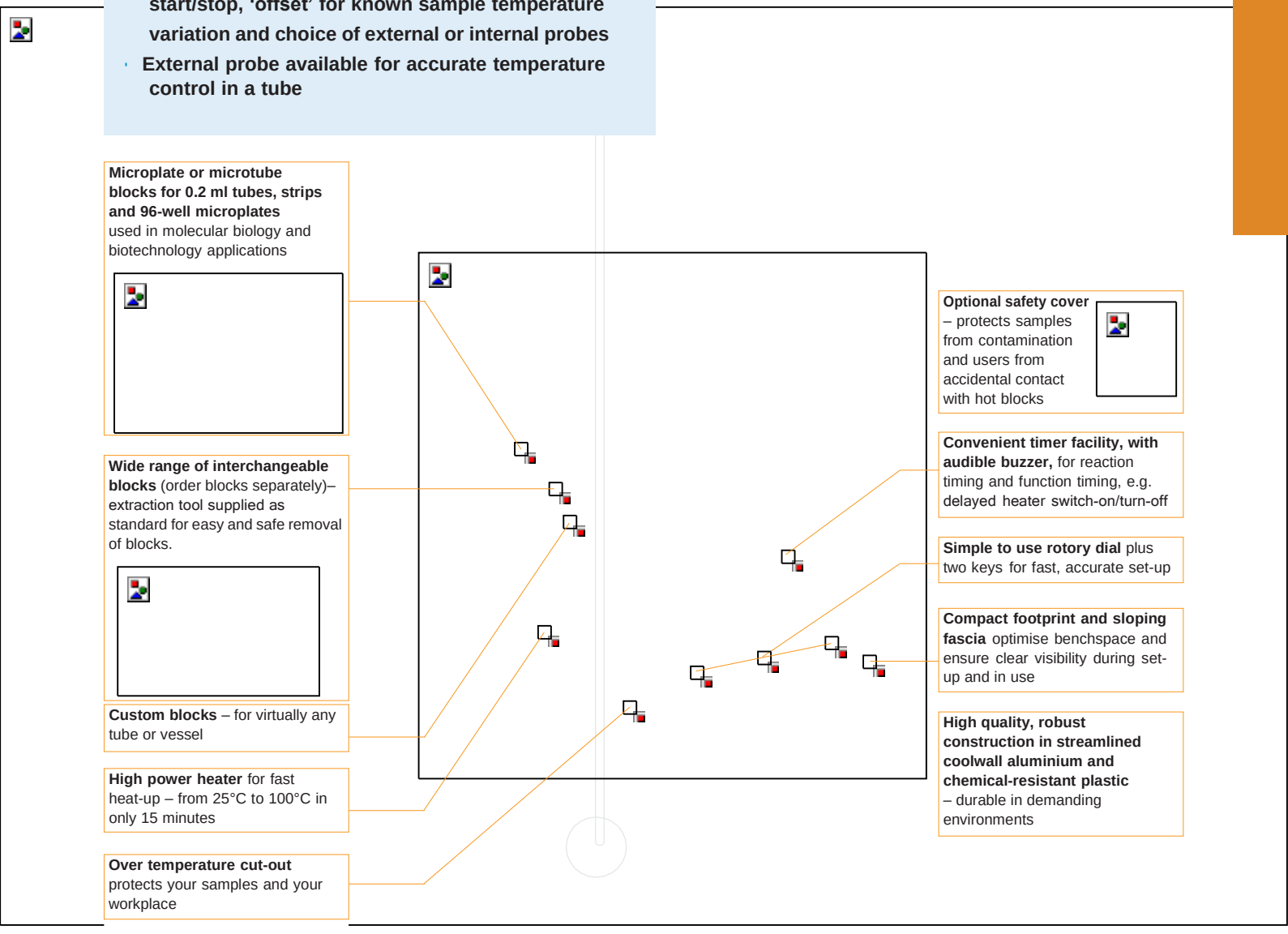
- General use - incubating samples at set temperatures, heating block for boiling of solutions in tubes
- Life-science – cell digestion, DNA/RNA extraction, post sequencing PCR clean-up - dry down step, boiling in vitro DNA/RNA/protein samples, incubating invitro reactions/digestions, extraction of DNA for real-time PCR analysis, denaturing nucleic acid and protein samples
- Industrial - digestion of environmental samples for chemical oxygen demand analysis, soil digests, maintaining temperatures
- Biopharm - conductivity testing
- Clinical - acylcarnitines derivatisation, MRSA and PBP2 latex testing, heating flush/media used in egg recovery, fertility to keep test tubes at correct temperature during egg collection

Showcase – **mid range/general purpose** example

Model QBD2* stability and uniformity ±0.1°C, range ambient +5 to 130°C

A versatile general purpose system with two removable/interchangeable blocks and a comprehensive specification to suit most dry block heating applications in the laboratory.

- **Stability and uniformity ±0.1°C**
- **Digital temperature control for optimum precision**
- **Heating range ambient +5°C to 130°C, with rapid heat-up time**
- **Range of convenient features including alarms, single and dual point calibration, programmed start/stop, 'offset' for known sample temperature variation and choice of external or internal probes**
- **External probe available for accurate temperature control in a tube**



* see summary table on pp. 8.3-8.4 for accessories and for other models in the range

Dry block heating systems with interchangeable blocks – models

Temperature range

ambient + 5 to 130°C
ambient + 5 to 200°C
ambient + 5 to 100°C

● = standard

	Precision digital			High performance digital	Economy analogue	
	QBD1	QBD2	QBD4	QBH2	QBA1	QBA2
	1-block system	2-block system	4-block system	2-block system	1-block system	2-block system
	 2 kg h: 100 mm d: 230 mm w: 200 mm	 2.5 kg h: 100 mm d: 280 mm w: 200 mm	 4 kg h: 100 mm d: 380 mm w: 200 mm	 2.5 kg h: 100 mm d: 280 mm w: 200 mm	 2 kg h: 100 mm d: 230 mm w: 200 mm	 3 kg h: 100 mm d: 280 mm w: 200 mm
Temperature range °C	ambient + 5 to 130			ambient + 5 to 200	ambient + 5 to 100	
Temperature setting range °C	15 to 130			15 to 200	0 to 100	
Setting resolution °C	0.1			0.1	2	
Stability @ 37°C, °C	± 0.1			± 0.1	± 1.0	
Uniformity within the block @ 37°C, °C	± 0.1			± 0.1	± 1.0	
Uniformity across similar blocks @ 37°C, °C	± 0.2			± 0.2	± 1.0	
Temperature display, LED	●			●	–	
Display resolution °C	0.1			0.1	–	
Heat up time 25° to 100°C mins	20			15	25	
Three programmable temperature/ time segments plus end-of-program segments	–			●	–	
Reaction timer, with audible buzzer	1 to 999 mins			1 to 999 mins	–	
Function timer for delay of heater start-up/switch-off	up to 72 hours			up to 72 hours	–	
Off-set adjustment	●			●	–	
Two-point calibration of internal and external probes	●			●	–	
High/low temperature alarms, settable to within 0.5°C of set temperature	●			●	–	
Fault indication display	●			●	–	
Power W	150	300	600	300	150	300
Supply voltage V	120 or 230			120 or 230	120 or 230	
Safety over temperature cut-out	thermal fuse			thermal fuse	thermal fuse	
Extraction tool for easy and safe block removal	●			●	●	

Options and accessories

x = not available ● = available

	QBD1	QBD2	QBD4	QBH2	QBA1	QBA2
Interchangeable blocks*						
No. of blocks 140 x 50 x 63 mm	1	2	4	2	1	2
QB-0 Plain block without holes	●	●	●	●	●	●
QB-10 for 24 x ø 10mm test tubes, 50 mm hole depth	●	●	●	●	●	●
QB-12 for 24 x ø 12 mm test tubes, 50mm hole depth	●	●	●	●	●	●
QB-13 for 12 x ø 13 mm test tubes, 50 mm hole depth	●	●	●	●	●	●
QB-16 for 12 x ø 16 mm test tubes, 50 mm hole depth	●	●	●	●	●	●
QB-17H for 10 x Falcon tubes tall 17mm ø test tubes, 75mm hole depth	●	●	●	●	●	●
QB-18 for 12 x ø 18 mm test tubes, 50 mm hole depth	●	●	●	●	●	●
QB-24 for 5 x ø 24 mm test tubes and universal bottles, 50 mm hole depth	●	●	●	●	●	●
QB-50 for 4 x ø 50 ml centrifuge test tubes, glass universals, 50 mm hole depth	●	●	●	●	●	●
QB-H for 56 x ø 0.2 ml microtube, 14 mm hole depth	●	●	●	●	●	●
QB-E0 for 24 x ø 0.5 ml microtube, 30 mm hole depth	●	●	●	●	●	●
QB-E1 for 24 x ø 1.5 ml microtube, 35 mm hole depth	●	●	●	●	●	●
QB-E2 for 24 x ø 2.0 ml microtube, 35 mm hole depth	●	●	●	●	●	●
QB-E5 for 12 x 5.0 ml microtube, 53.5 mm hole depth	●	●	●	●	●	●
QB-DN Dolphin nose tube 24 x ø 11.13mm to ø 6.1mm	●	●	●	●	●	●
External Pt1000 temperature probe						
QBEP Standard probe. For in-sample or in-block temperature control; encased in stainless steel sheath, ø 3 mm x 30 mm long, with 350 mm of cable	●	●	●	●	x	x
QBEP-WM Short-form probe. For in-sample or in-block temperature control; encased in stainless steel sheath, ø 3 mm x 14 mm long, with 350 mm of cable	●	●	●	●	x	x
Microplate blocks for molecular biology and biotechnology applications						
Double-size blocks 140 x 100 x 75 mm supplied with additional extraction tool						
QDP-H 96 holes in microplate configuration for 0.2 ml microplates, strips or individual tubes Uniformity ± 0.3°C within tubes across the block; 6.2 mm ø holes, 14 mm hole depth	x	●	x	●	x	●
QDP-FL Universal block for standard 96-well plates (u-well, v-well, flat bottom, high temperature) Uniformity ± 0.5°C between wells; supplied with hinged, double layer lid to create an insulated incubation chamber	x	●	x	●	x	●
Safety covers (not required with QDP-FL Microtiter blocks)						
Made from tough clear acrylic for maximum visibility whilst preventing accidental touching of a hot block or contamination of samples from splashes Clearance height 85 mm	QBL1	QBL2	QBL4	QBL2	QBL1	QBL2

* Custom blocks available - please enquire

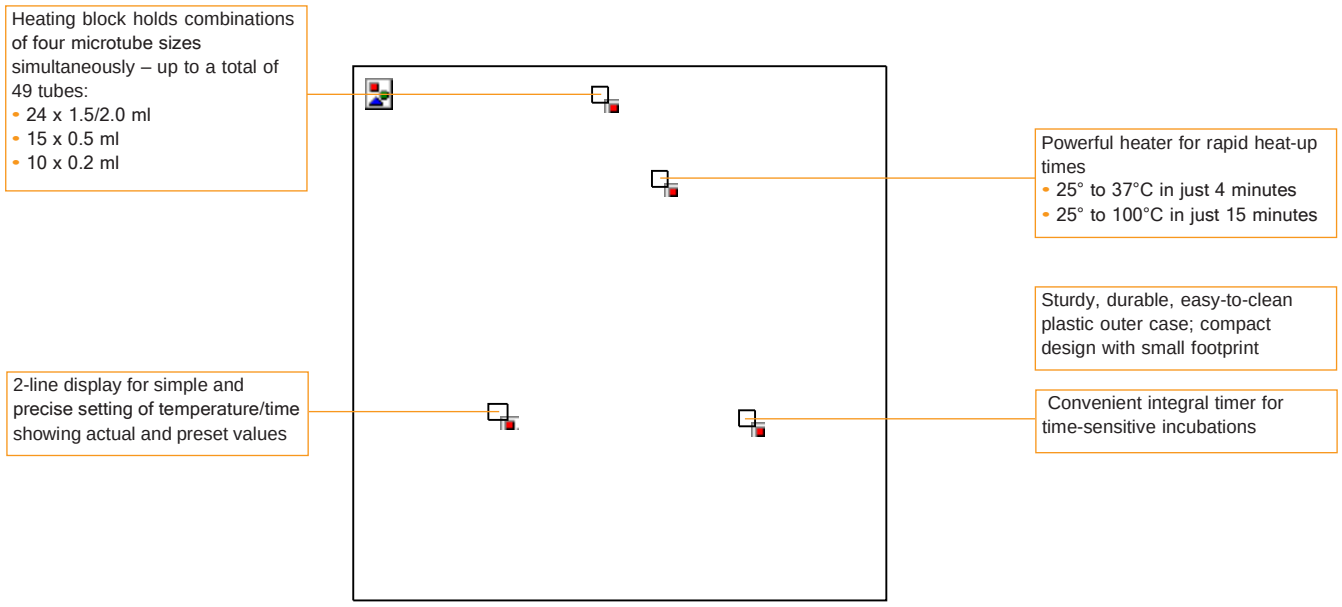
BTD dry block heater for microtubes

stability and uniformity ±0.1°C, range ambient +5 to 100°C

A compact and flexible fixed block system for rapid and precise heating of microtubes up to 100°C.

- **Stability ±0.1°C**
- **Digital temperature control for optimum precision**
- **Heating range ambient +5°C to 100°C, with rapid heat-up time**
- **Capacity for up to 49 microtubes in a combination of four common sizes**
- **Integral timer**

2 year warranty



Applications:

- Life-science/cancer research - DNA extraction incubations, DNA denaturation, PCR, ELISA and Western blotting, molecular biology
- General - heating samples

Dry block heating systems with fixed microtube blocks – model and specifications

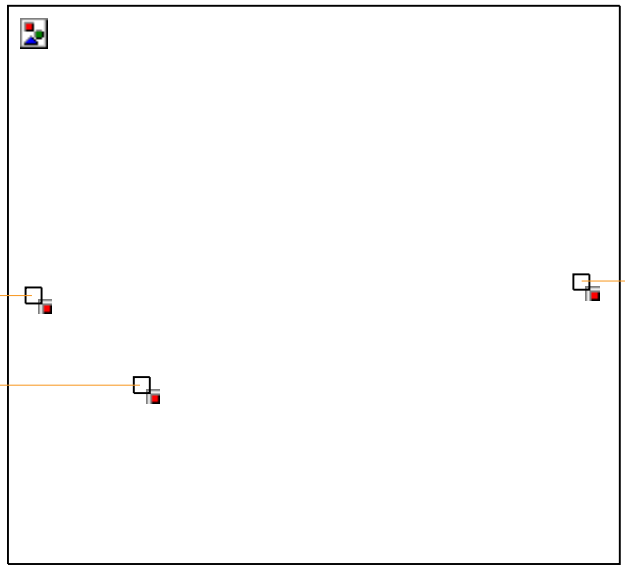
● = standard

			Digital control
			BTD
			 2.5 kg h: 110 mm d: 230 mm w: 210 mm
Stability		°C	±0.1
Uniformity	@ 37°C	°C	±0.1
Block dimensions		mm	ø 130
Temperature control range		°C	ambient +5 to 100
Temperature setting range		°C	25 to 100
Setting resolution		°C	0.1
Temperature display			2 line x 16 character LCD
Heat up time	25° to 37°C	mins	4
	25° to 100°C	mins	15
Timer			1 min to 96 hours
Power		W	200
Supply voltage		V	120 or 230
Safety	over temperature cut-out		thermal fuse

BT5D high temperature dry block heater Range ambient +10 to 400°C

Convenient digitally controlled dry block heating system for high temperature applications. Provides temperature control without the need for fluids and reduces the risk of contamination.

- **Temperature range ambient +10ºC to 400ºC**
- **Stability ±0.5ºC, uniformity 1%**
- **Timed or continuous operation**
- **Choice of two models with different block capacities**



BT5D-16 high temperature block heater

Choice of two models:
BT5D-16 for 38 x ø16 mm tubes
BT5D-26 for 22 x ø26 mm tubes
Other sizes available, please enquire

An adjustable over temperature cut-out protects users, valuable samples and the workplace

Robust construction for long term durability and reliability

Digital controller for accurate and reproducible time and temperature setting

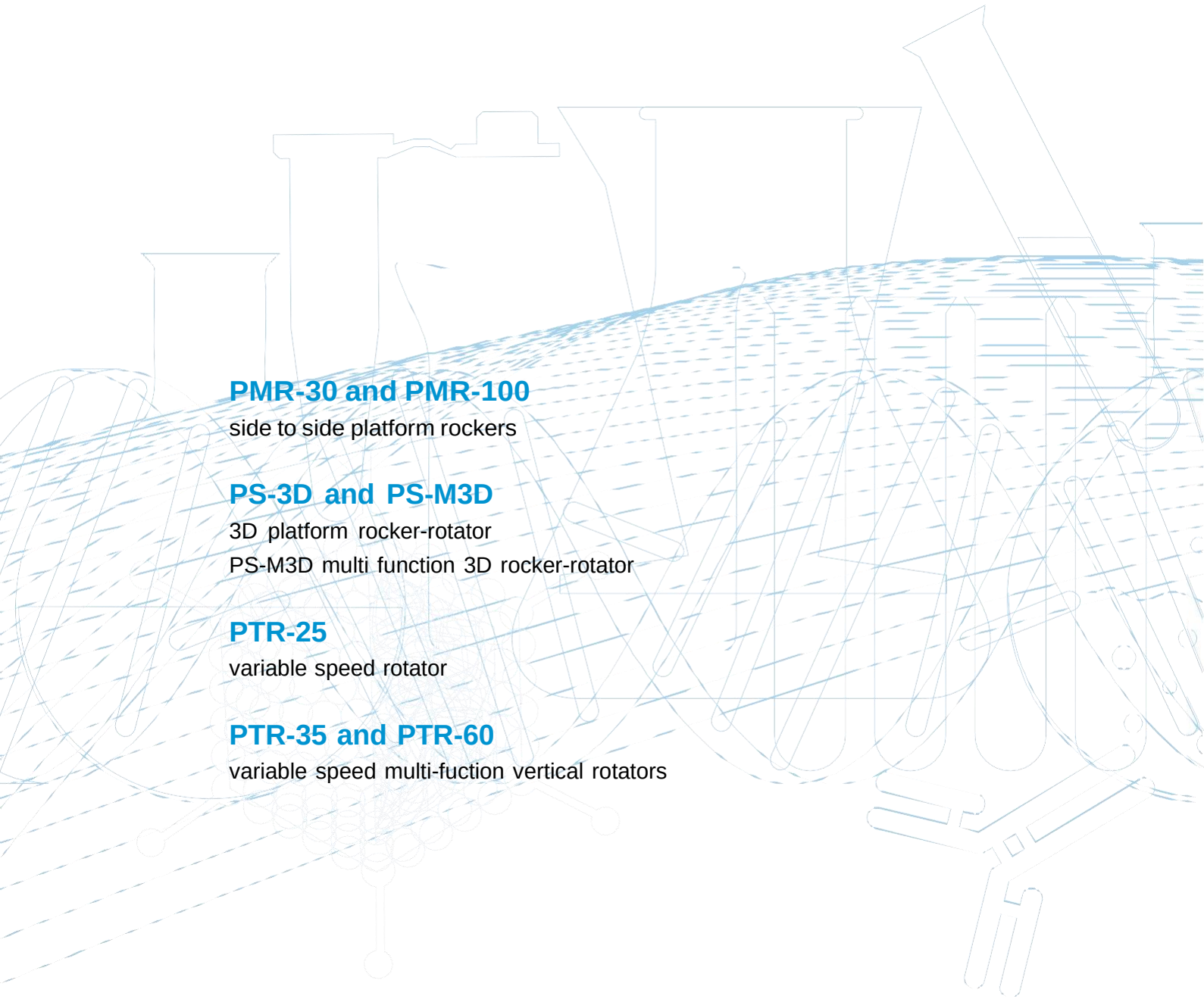
Applications:

- Veterinary laboratories - digestion of tissue samples for lead analyses
- Chemical laboratories - organic systhesis
- Technology and research - materials (explosives) testing
- Any application requiring heating in a dry block up to 400°C

Products for special high temperature applications – models and specifications

			High temperature block heater, digital control
			BT5D
			 h: 150 mm d: 410 mm w: 205 mm
Temperature range		°C	ambient +10 to 400
Stability (DIN 58966)		°C	±0.5 (up to 300°C)
Uniformity		°C	1%
Display			LED
Display resolution		°C	1
Timer		mins	1 to 9999
Alarms			high/low
Heat up time	ambient to maximum	mins	100
Heating block	l/w/d	mm	190 x 140 x 75
Capacity		BT5D-16	38 x ø 16 x d60 mm tube
		BT5D-26	22 x ø 26 x d60 mm tube
Safety	over temperature protection		adjustable cut-out
Electrical power	230 V 50/60 Hz	kW	0.75
	120 V 50/60 Hz	kW	0.75

8 Rockers and rotators



PMR-30 and PMR-100
side to side platform rockers

PS-3D and PS-M3D
3D platform rocker-rotator
PS-M3D multi function 3D rocker-rotator

PTR-25
variable speed rotator

PTR-35 and PTR-60
variable speed multi-fuction vertical rotators

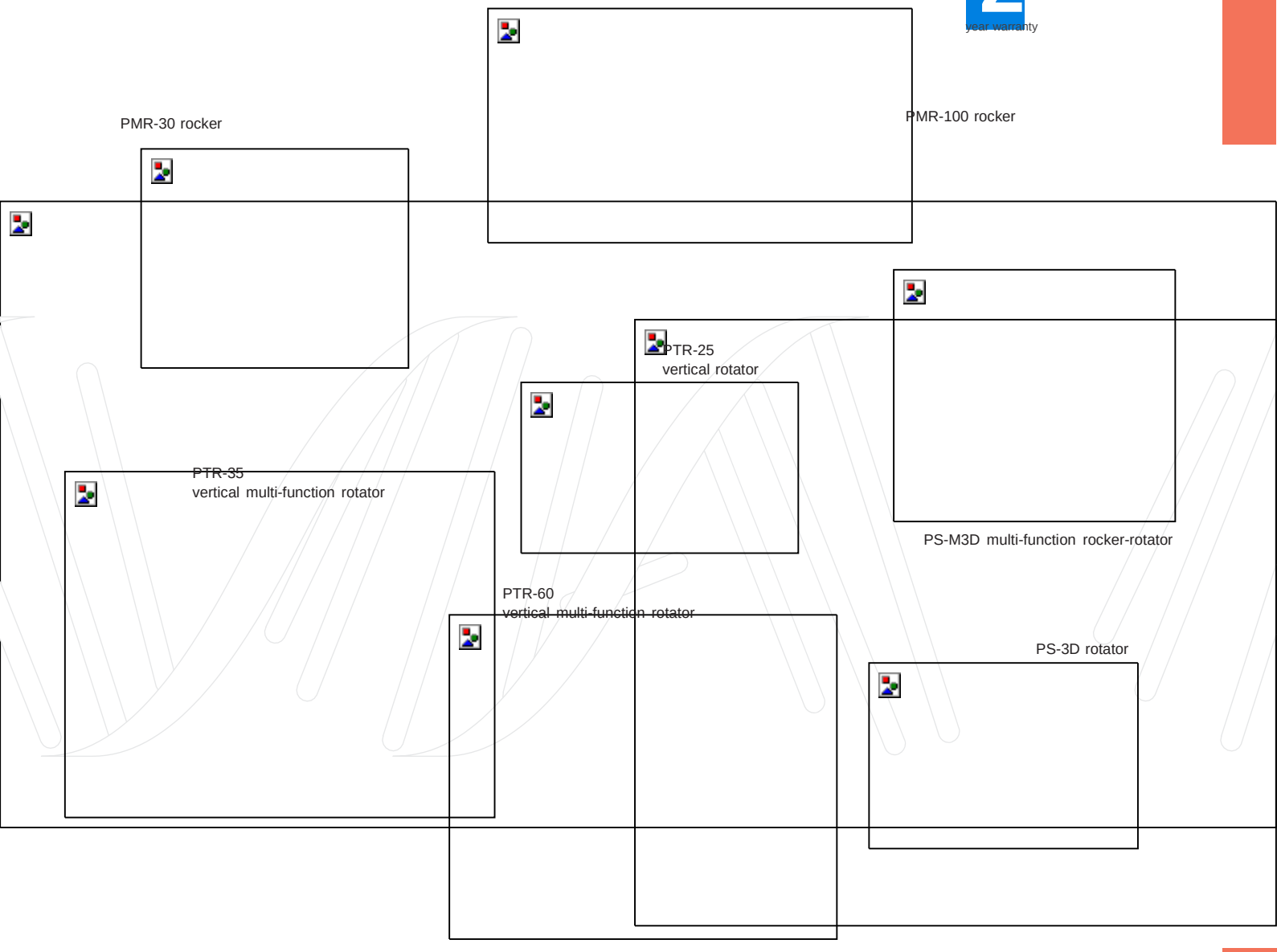
Rockers and rotators

A comprehensive range of efficient and sturdy rocking and rotating equipment for a wide range of mixing applications in life-science, cell culture, chemistry, and other analytical/ research laboratories.

Suitable for use in cold rooms and incubators.

- Platform rockers
  – side to side platform
- 3D platform rocker-rotator
  - 'sunflower' action platform 3D rocker-rotator
- Multi-function rotators
  – 3D and 360° vertical turn, for light loads and microtubes

2 year warranty



PMR-30 platform rocker – fixed tilt

Compact but highly functional fixed-angle platform rocker in the Grant bio range, providing a smooth side to side rocking motion for gentle sample agitation in tubes, culture flasks, dishes and boxes. Suitable for use in cold rooms and incubators.

- **Variable speed: 5 to 30 oscil/min**
- **Fixed 7° tilt angle**
- **Load up to 1.0 kg**
- **Continuous or timed operation, with automatic switch-off**

Fixed tilt 7°

Reliable and extremely quiet motor produces regulated and reproducible rocking throughout the speed range

Compact, sturdy construction with a low profile and small footprint – fits neatly into the smallest workspace

Simple timer setting, with large easy-to-read LED display indicating clearly the time remaining

Smooth, non-slip mat supplied as standard – prevents vessels from slipping

Simple graduated speed setting - from 5 to 30 oscil/min

Select either continuous or timed operation – the integral electronic timer ensures accurate count-down for repeatability of time-sensitive incubations

Ambient operating temperature range of 4°C to 40°C allows use in cold room or incubator

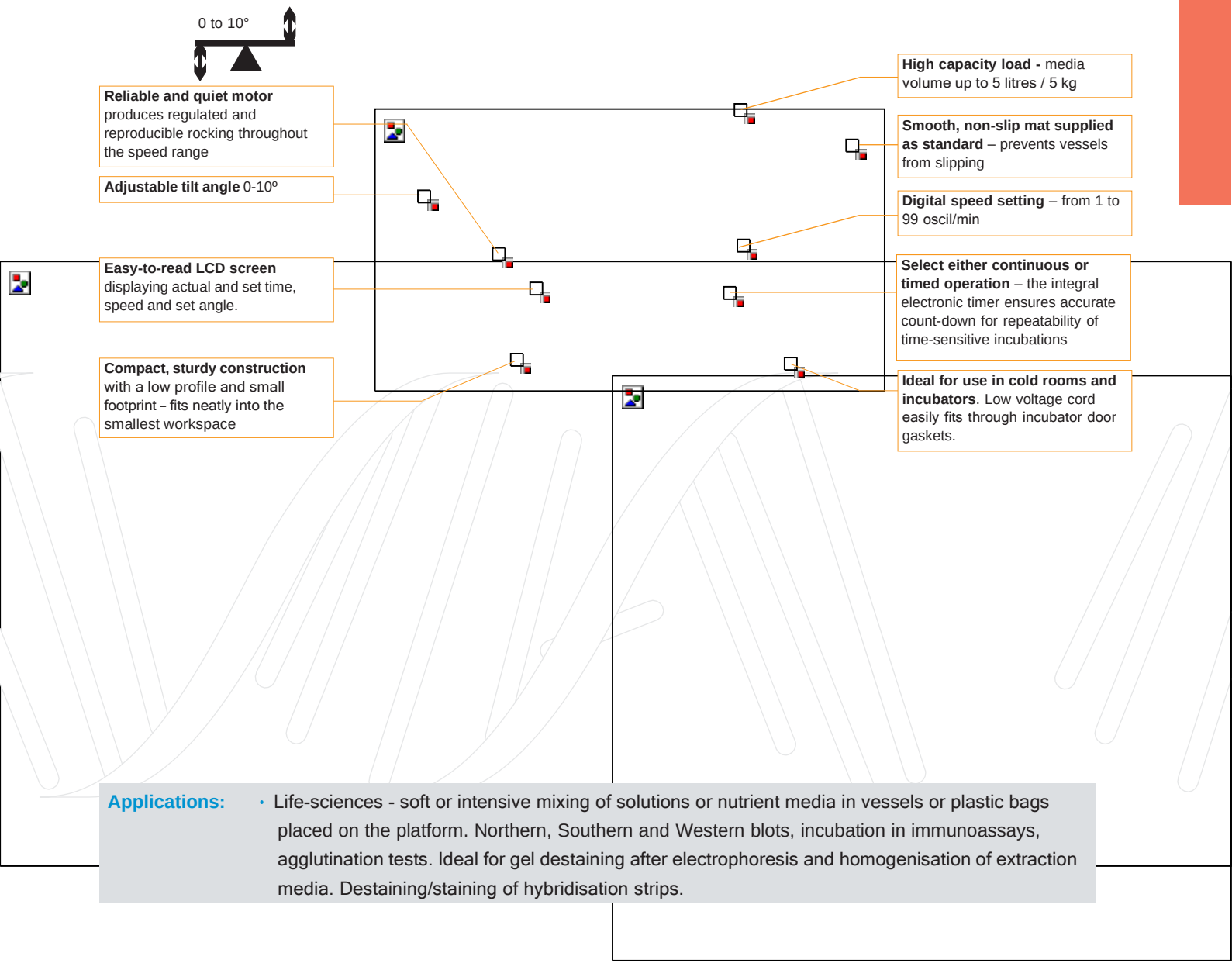
Applications:

- Life-sciences - ideal for minigel destaining after electrophoresis, conducting reactions of Northern, Southern and Western blots, immunoblots, hybridisation washes, cell culture, visualisation of blots, immunostaining, protein electrophoresis.

PMR-100 platform rocker – adjustable tilt

Large capacity, adjustable angle and speed platform rocker, providing soft or intensive side to side rocking for optimal mixing of samples. Suitable for use in cold rooms or incubators with ambient operating temperature range +4°C to 40°C.

- **Variable speed: 1 to 99 oscil/min**
- **Tilt angle range, adjustable up to 10°**
- **Load up to 5 kg**
- **Continuous or timed operation, with automatic switch-off**



Applications:

- Life-sciences - soft or intensive mixing of solutions or nutrient media in vessels or plastic bags placed on the platform. Northern, Southern and Western blots, incubation in immunoassays, agglutination tests. Ideal for gel destaining after electrophoresis and homogenisation of extraction media. Destaining/staining of hybridisation strips.

Grant-bio compact rockers - models and specifications

● = optional

		PMR-30	PMR-100
		Fixed tilt platform rocker	**Adjustable tilt platform rocker**
		 h: 120 mm d: 205 mm w: 220 mm weight: 2kg	 h: 250 mm d: 480 mm w: 400 mm weight: 13kg
Speed	oscill/min	5 to 30	1 to 99
Fixed tilt angle	 from 51-99 oscil/min	7° -	- 10°
Tilt angle range	from 1-50 oscil/min	-	0-9°(1°increment)
Timer, with automatic switch-off		1min to 23hrs 59mins	1min to 99hrs 59min
Maximum continuous operation time		168 hrs	
Platform dimensions (working area)	mm	210 x 210	460 x 360
Maximum load	kg	1	5
Display		4 digit LED	LCD, 16 x 2 character
Ambient temperature range	°C	4 to 40	4 to 40
Input voltage	V dc	12	12
Input current	A	0.32	1.1

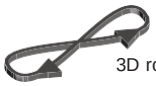
Accessories

PDM – dimpled mat		●	-

PS-3D fixed tilt 3D platform rotator

Variable speed, fixed-angle 3D rocker-rotator in the Grant-bio™ range providing smooth orbital motion for mixing in commonly used vessels – culture flasks, dishes, boxes and tubes. Suitable for use in cold rooms and incubators.

- **Variable speed: 5 to 60 rpm**
- **Fixed 7° tilt angle**
- **Loads up to 1.0 kg**
- **Ambient operating temperature range +4ºC to 40ºC**

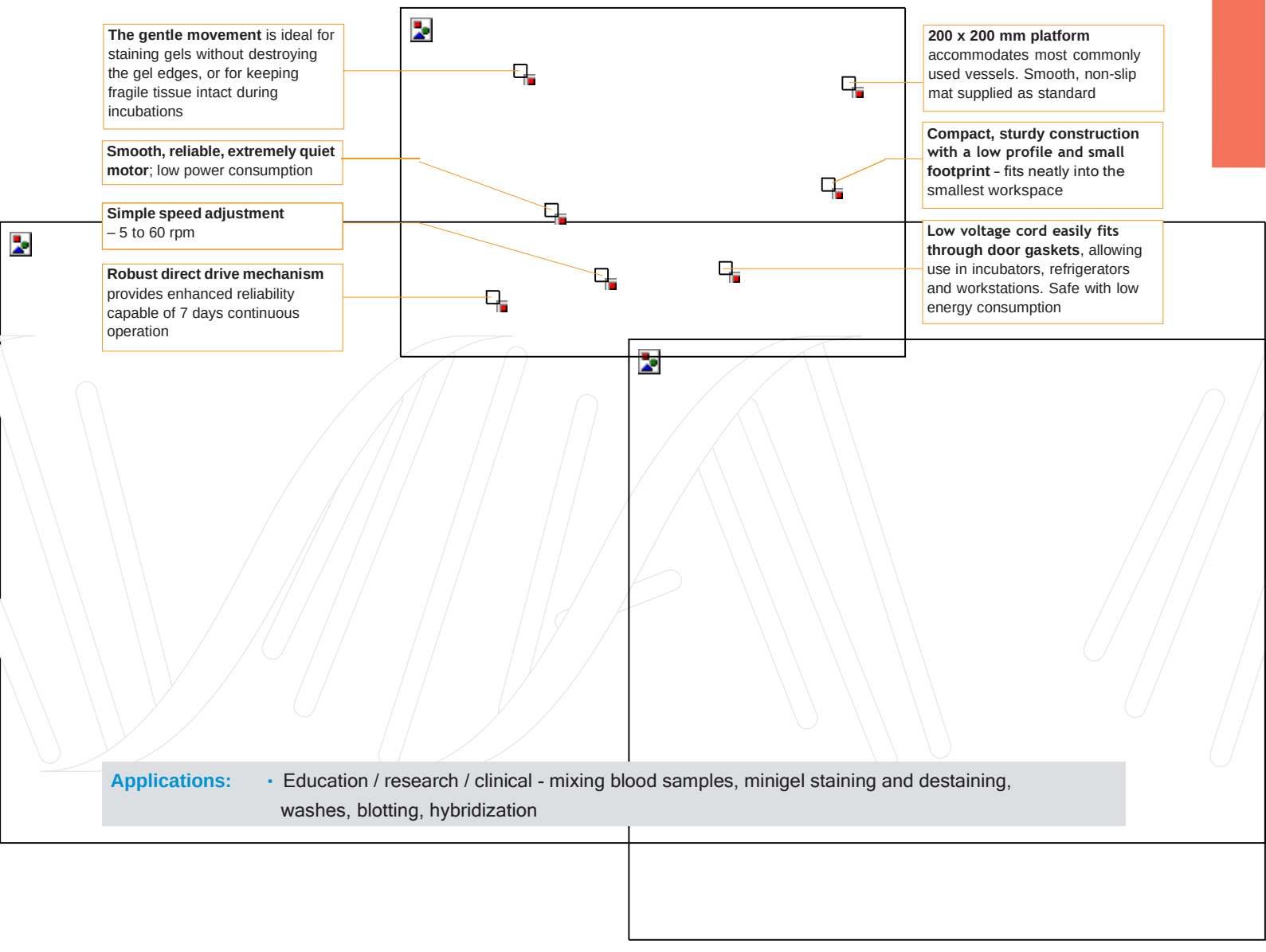


The gentle movement is ideal for staining gels without destroying the gel edges, or for keeping fragile tissue intact during incubations

Smooth, reliable, extremely quiet motor; low power consumption

Simple speed adjustment – 5 to 60 rpm

Robust direct drive mechanism provides enhanced reliability capable of 7 days continuous operation



200 x 200 mm platform accommodates most commonly used vessels. Smooth, non-slip mat supplied as standard

Compact, sturdy construction with a low profile and small footprint – fits neatly into the smallest workspace

Low voltage cord easily fits through door gaskets, allowing use in incubators, refrigerators and workstations. Safe with low energy consumption

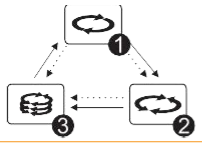
Applications:

- Education / research / clinical - mixing blood samples, minigel staining and destaining, washes, blotting, hybridization

PS-M3D multi-function 3D rocker-rotator

Variable speed, fixed-angle, multi-function 3D rocker-rotator providing all that is required – rotation, reciprocation and vibration – to fully optimise the mixing of different sized particles in flasks, dishes, petri dishes and boxes.

- **3D rotation, reciprocation and vibration functions all in one product**
- **3D rotation speed: 1 to 100 rpm**
- **Reciprocal 3D rotation: 1 to 360° turning angle**
- **Vibration: 1 to 5° turning angle, programmable in a burst of 1 to 5 seconds**
- **Fully programmable sequence of all functions**
- **Loads up to 1.0 kg**



Smooth, non-slip mat supplied as standard – prevents vessels from slipping

Compact, with a low profile and small footprint, extremely quiet in operation – fits neatly and unobtrusively into the workspace

Very easy to operate, with simple set-up of multi-segment programs via push buttons and the 2-line LCD status display

Low voltage cord easily fits through door gaskets, allowing use in incubators, refrigerators and workstations. Safe with low energy consumption

All actions – rotation, reciprocation and vibration – can be set for continuous or timed operation, or linked together in different combinations to ensure optimum mixing conditions for your application

Reliable stepper motor and sturdy construction will deliver years of consistent performance

Ambient operating temperature range of 4°C to 40°C

Applications:

- Education / clinical/ research labs - suitable for mixing applications in many different fields, with specific applications including: immuno precipitations and other affinity matrix applications, treatment of adherent tissue culture in small volumes, e.g. for trypsinisation, gel staining and destaining, antibody staining, washes, hybridisations, Southern blots, Western blots, in situs

Grant-bio compact rockers and rotators - models and specifications

● = optional

		PS-3D	PS-M3D
		Fixed tilt 3D platform	**Multi-function 3D**
		 h: 80 mm d: 150 mm w: 85 m weight: 1.2 kg	 h: 125 mm d: 170 mm w: 225 mm weight: 2 kg
Speed	rpm	5 to 60	1 to 100
Tilt angle		7°	
Turning angle (reciprocation mode)		–	0 to 360° (step 30°)
Rocking angle (vibration mode)		–	0 to 5° (step 1°)
Orbit diameter	mm	–	22
Timer for orbital and reciprocation mode	sec	–	0 to 250
Timer for vibration mode sec		–	0 to 5
Number of cycle repetitions		–	0 to 125
Maximum continuous operation time		168hrs	24hrs
Platform dimensions (working area)	mm	200 x 200	
Maximum load	kg	1	1
Display		–	2 x 16 character LCD
Ambient temperature range	°C	4 to 40	
Input voltage	V dc	12	

Accessories

PDM – dimpled mat		●	●

PTR-25 360° vertical mini rotator

Compact, economy solution with simple to use controls, providing thorough mixing of samples in tubes up to 50 ml. Suitable for use in cold rooms and incubators, operating at ambient temperature range +4°C to 40°C.

- **360° vertical rotation**
- **Vertical rotation speed range: 5 to 30 rpm**
- **Timer with audible alarm and automatic switch-off**
- **Simple to use controls**

Very easy to operate with simple controls and easy to view LCD screen

Reliable and extremely quiet motor produces regulated rotation throughout the speed range

Compact with a low profile and small footprint - fits neatly into the workspace

Low voltage cord easily fits through door gaskets, allowing use in incubators, refrigerators and workstations

Platform accommodating 22 tubes (up to 15mm diameter) is included as standard. See additional accessories on page 9.10. Platform PPRS4-12 shown.

Digital timer with audible alarm, alerts when attention is required

Applications:

- Life-sciences - hybridisation reactions, cell growth, soft extraction, homogenisation of biological components in solution, binding reactions, washing of magnetic particles, preventing blood coagulation
- Any application requiring simple end over end rotation of tubes

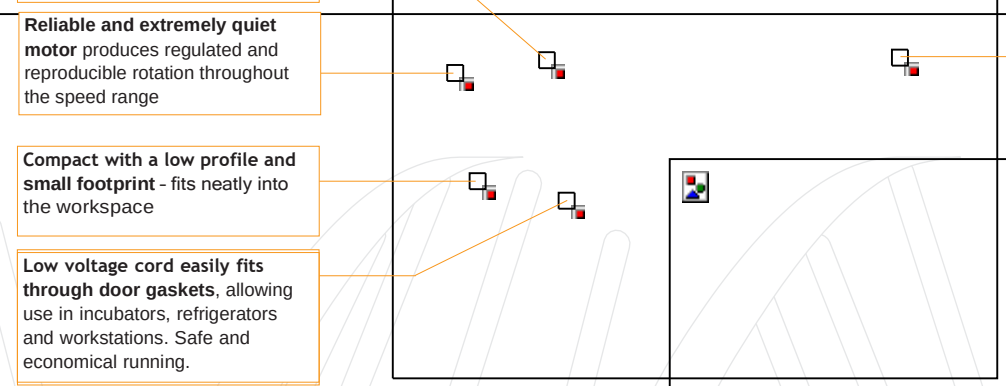
PTR-35 and PTR-60 360° vertical multi-function rotators

Compact and efficient variable-speed, variable-angle vertical rotators providing all the functionality – vertical rotation, reciprocation and vibration – for thorough mixing of microtubes and reproducible sample preparation. All mixing functions can be linked or used separately.

- **360° vertical rotation, reciprocation and vibration functions all in one compact product**
- **Choice of two models with different tube capacities**
- **Vertical rotation speed: 1 to 100 rpm**
- **Reciprocal rotation: 1 to 90° turning angle**
- **Vibration: programmable in a burst of 1 to 5 seconds**
- **Fully programmable sequence of functions, including pause**
- **Optional extra platforms to accommodate microplates and tubes up to 50ml see p 9.10**

PTR-35

All actions – rotation, reciprocation and vibration – can be set for continuous or timed operation, or linked together in different combinations to ensure optimum mixing conditions for your application



Very easy to operate, with simple set-up of multi-segment programs via push buttons and the 2-line LCD status display

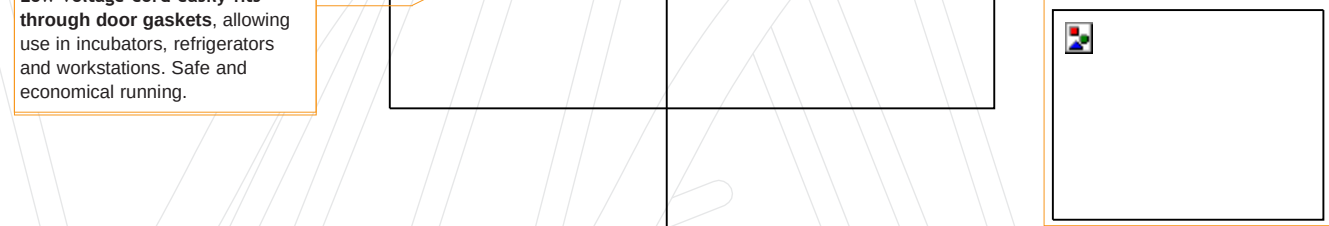
Reliable and extremely quiet motor produces regulated and reproducible rotation throughout the speed range

Compact with a low profile and small footprint - fits neatly into the workspace

Low voltage cord easily fits through door gaskets, allowing use in incubators, refrigerators and workstations. Safe and economical running.

Supplied with platform accommodating up to 26 microtubes. Maximum rotating speed of up to 100 rpm

The **PTR-60** has the same functionality as the PTR-35 and is supplied with platform accommodating up to 48 microtubes



Applications:

- Life-science laboratories - for hybridization reactions, cell growth, soft extraction and homogenisation of biological components in solutions, as well as for reactions of binding and washing of magnetic particles, cell suspensions, incubations, extraction procedures, gel ashing mixing capillary blood samples.

Grant-bio rotators – models and specifications

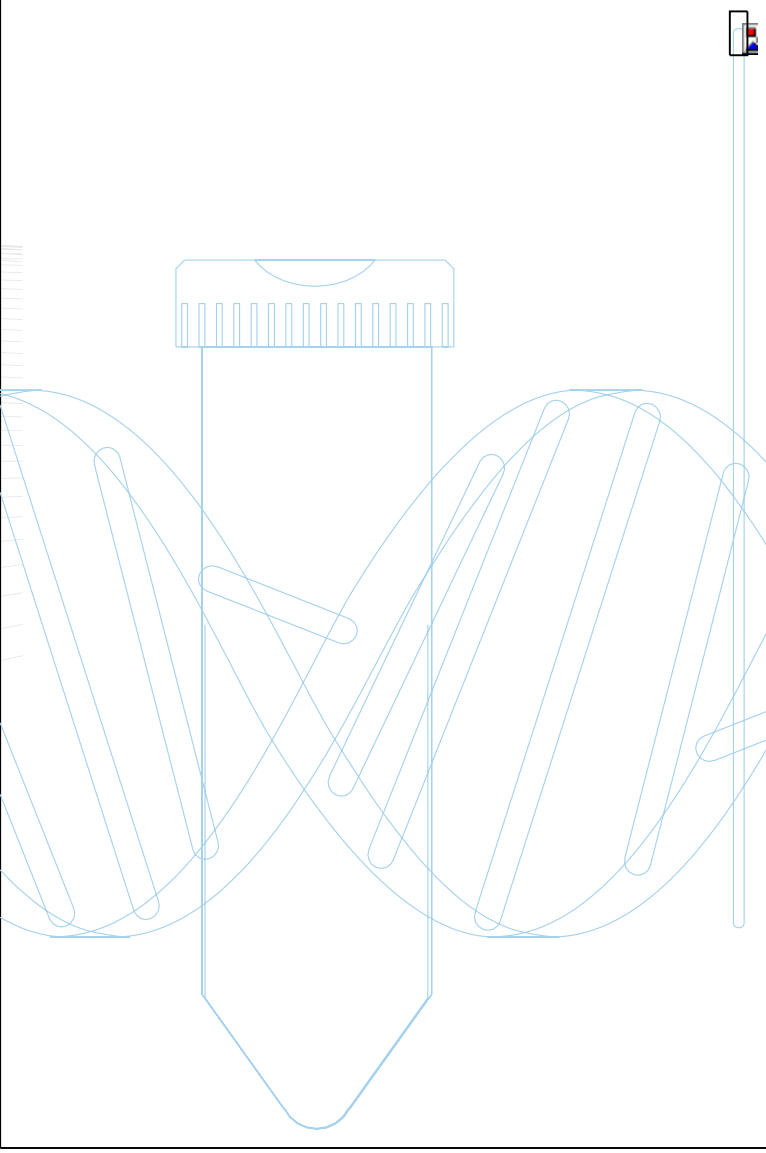
● = optional

		PTR-25	PTR-35	PTR-60
		360° vertical rotators	360° vertical multi-function rotators	
		 h: 175 mm d: 110 mm w: 310 mm weight: 1kg	 h: 195 mm d: 155 mm w: 365 mm weight: 1.8kg	 h: 230 mm d: 230 mm w: 420 mm weight: 3.8kg
Speed	rpm	5 to 30	1 to 100	
Turning angle (reciprocal mode)	°	–	1 to 90	
Turning angle (vibration mode)	°	–	1 to 5	
Timer, with automatic switch-off		1 min to 24 hours		
Timer (orbital/360° vertical or reciprocal mode)	sec	–	1 to 250	
Timer (vibration mode)	sec	–	1 to 5	
Pause	sec	–	1 to 5	
Microtube capacity	ø 15mm max	22	26	48
Maximum load	kg	0.5		0.8
Display		LED	2 x 16 character LCD	
Ambient temperature range	°C	4 to 40		
Input voltage	V dc	12		24
Input current	A	0.11	0.66	0.75

Accessories

PRS-22 replacement platform for 22 tubes up to ø 15 mm tube volumes 1.5-15 ml	●	–	–
PRSC-18 heavy duty tube adaptor for 18 tubes ø 14-15 mm	●	–	–
PPRS4-12 holds 4 x 50ml and 12 x 1.5-15ml	●	–	–
PRSC-10 heavy duty adaptor for 10 tubes ø 30 mm tube volumes up to 50 ml	–	●	–
PRSC-22 heavy duty adaptor for 22 tubes ø 15 mm tube volumes up to 15 ml	–	●	–
PRS-10 for 10 tubes up to ø 30 mm tube volumes up to 50 ml	–	●	–
PRS-26 replacement platform tube adaptor for 26 tubes up to ø 15 mm, 1.5 -15 ml	–	●	–
PRS-5-12 combined platform for 5 tubes up to ø 30 mm and 12 tubes up to ø15 mm, tube volumes 50 ml/1.5-15 ml	–	●	–
PRS-1DP platform for microplates, deep well plates and racks for tall tubes 0.5 and 1 ml	–	●	–
PRS-14 platform for 14 tubes up to ø 30 mm tube volumes up to 50 ml	–	–	●
PRS-48 replacement platform for 48 tubes up to ø 15 mm, tube volumes 1.5-15 ml	–	–	●
PRS-8-22 platform for 8 tubes up to ø 30 mm plus 22 tubes up to ø 15 mm tube volumes up to 50 mL/1.5-15 ml	–	–	●

9 Shakers, mixers and stirrers



Orbital platform shakers

PSU-10i orbital platform shaker

PSU-20i multi-functional orbital platform shaker

Variable speed microplate shaker

PMS-1000i two or four microplate shaker

MPS-1 multiplate shaker

Vortex mixers

V-32 multi vortex mixer for tubes

PV-1 personal vortex mixer

Magnetic stirrer

MMS-3000 mini magnetic stirrer

MSH300i digital magnetic stirrer hotplate

Shakers, mixers and stirrers

A range of compact, stylish and efficient equipment for many routine shaking, mixing and stirring applications in chemistry, life-science and other analytical/research laboratories. Suitable for use in cold rooms and incubators (operating temperature range +4°C to 40°C).

- Orbital shaking platforms – single and multi platform
- Microplate and microtube shakers
- Vortex mixers
- Stirrers – magnetic

2 year warranty

PSU-20i

V-32

PV-1

PSU-10i

MPS-1

MSH-300i

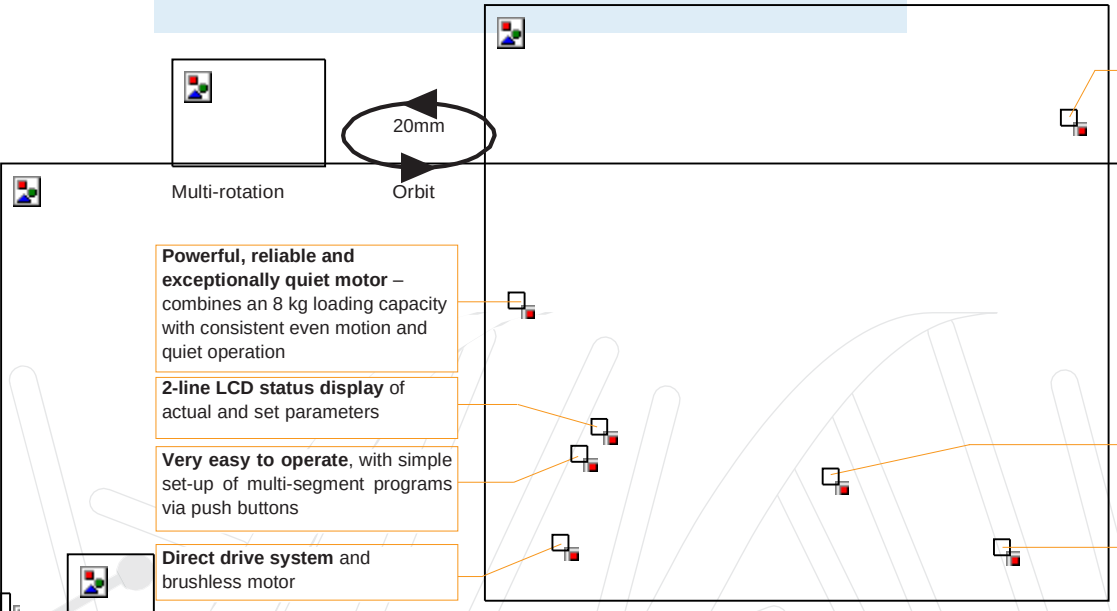
MMS-3000

PMS-1000i

PSU-20i orbital multi-platform shaker

Powerful and efficient microprocessor controlled, multi-functional orbital shaker providing all that is required to mix your samples – rotation, reciprocation and vibration. This enables optimisation of the mixing whether in flasks, beakers, petri dishes or other laboratory vessels.

- **Orbital motion (20 to 250 rpm), reciprocation (20 to 250 rpm) and vibration functions all in one product**
- **Loading capacity - 8 kg**
- **Fully programmable sequence that can use one or all the functions**
- **6 interchangeable platforms for vessels up to 1000ml including a multi-level platform to hold a large number of various microplates, Petri dishes and culture bags.**
- **Reciprocal rotation: 0 to 360° turning angle, in 30 degree steps**
- **Vibration: 0 to 5° turning angle, 1 degree steps**



PSU-20i fitted with PUP-330

Universal detachable platform accommodates vessels of different shapes and sizes for maximum flexibility. **Please order separately.** See page 10.4 for full list of accessory platforms. No tools are needed to change the platform

Powerful, reliable and exceptionally quiet motor – combines an 8 kg loading capacity with consistent even motion and quiet operation

2-line LCD status display of actual and set parameters

Very easy to operate, with simple set-up of multi-segment programs via push buttons

Direct drive system and brushless motor

All mixing functions – orbital motion, reciprocation and vibration – can be set for continuous or timed operation, or be linked together in different combinations to establish optimum mixing and ensure accurately repeatable conditions for your application

Low voltage cord easily fits through door gaskets, allowing use in incubators, refrigerators and workstations. Safe and low energy consumption.

Supplied without a platform.

Applications: ■ Biomedical and biopharmaceutical laboratories - cultivation of cells, extracting, dissolving slow reacting samples, extraction of mineral oil of soil, of tissue culture for analytical diagnostics, de-aeration of tested biodegradable materials and samples, rotating closed containers for dialysis, bacterial growth

PSU-10i orbital platform shaker

Microprocessor controlled shaking platform providing smooth and quiet horizontal orbital motion for mixing in bottles, flasks and beakers.

- **Variable shaking speed: 50 to 450 rpm**
- **Reliable direct drive system**
- **Automatic load balancing system**
- **Continuous or timed operation with automatic switch-off**
- **5 interchangeable platforms for vessels up to 250 ml including an 88 place spring loaded platform for tubes up to 30mm diameter**
- **Simple to set up and easy to operate**
- **Loads up to 3 kg**

10mm

Orbit

Soft start feature ensures a smooth ramp-up – avoids potential damage to vessel content

Exceptionally quiet motor – consistent and even shaking

2-line LCD display clearly indicates both set and actual shaking speed, plus set and elapsed time.

Works in combination with simple push buttons for easy set-up

PSU-10i fitted with PUP-12 universal platform

Choice of 5 interchangeable platforms to suit different types of vessels - maximum flexibility. Please order platform separately

Low voltage power supply provides for safe cold room operation and low energy consumption

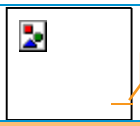
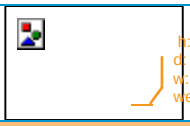
Integral electronic timer with audible alarm and automatic switch-off – accurate repeatability of time sensitive incubations

Supplied without a platform.

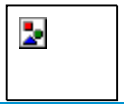
Applications:

- Biotechnology and microbiology - micro-organism cultivation and extraction of biologically active substances
- Immunology and biochemistry - agglutination and precipitation assay
- Biochemistry - washing off electrophoresis gel
- Molecular and cell biology - cultivation of biological liquids

Shakers – models and specifications

(all heights excl. platform)		Multi platform shaker	Shaking platform
		PSU-20i	PSU-10i
		 h: 130 mm d: 410 mm w: 410 mm weight: 13kg	 h: 90 mm d: 205 mm w: 220 mm weight: 4 kg
Speed (depends on loading)	rpm	20 to 250	50 to 450
Orbit	mm	20	10
Maximum load	kg	8	3
Timer, with automatic switch-off		1 min to 96 hours	
Motion timer (orbital/reciprocal modes)	sec	0 to 250	–
Motion timer (vibration mode)	sec	0 to 5	–
Display		2-line 16 character LCD	
Angle (reciprocal mode)	°	0 to 360	–
Angle (vibration mode)	°	0 to 5	–
Input voltage	V dc	12	
Input current	A	3.2	0.8
Ambient temperature range	°C	4 to 40	

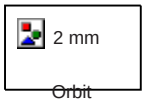
Accessories

P16-88 Platform with spring holders for up to 88 tubes up to 30mm diameter 	–	●
P12-100 Platform with clamps for 12 x 100/150ml flasks/beakers. Dimensions: 250 x 190 mm 	–	●
Bio PP-4 Flat platform with non-slip rubber mat. Dimensions: 230 x 230 mm 	–	●
P6-250 Platform with clamps for 6 x 250-300 ml flasks/beakers. Dimensions: 250 x 190 mm 	–	●
PUP-12 Universal platform, with adjustable bars. Dimensions: 270 x 195 mm HB-200 extra holding bars 	–	●
PUP-330 Adjustable bars and two fixing levels. Dimensions: 345 x 430 x 105 mm HB-330 extra holding bars 	●	–
PP-20-(2/3/4 level) Flat platform with non-slip rubber mat. Dimensions: 480 x 380 mm Height between levels: 140 mm 	●	–
P30-100 Platform with clamps for 30 x 100-150 ml flasks 	●	–
P16-250 Platform with clamps for 16 x 250-300 ml flasks 	●	–
P9-500 Platform with clamps for 9 x 500 ml flasks 	●	–
P6-1000 Platform with clamps for 6 x 1000 ml flasks 	●	–

PMS-1000i microplate shaker

Compact and efficient variable speed, horizontal shaker for reliable, regulated shaking of two or four microplates.

- **Variable shaking speed: 150 to 1200 rpm**
- **Direct drive and brushless motor**
- **Set and display the speed in rpm**
- **Quick and easy screw fitting of standard-depth multiwell plates**
- **Continuous or timed operation, with automatic switch off**
- **Holds two or four microplates**
- **Operating temperature 4˚C to 40˚C**



PMS-1000i fitted with platform for two microplates

Platform for two microtitre plates supplied as standard. Platform for four plates (MPP4) available as an option

Quick and easy to use screw fittings – keep the plates securely in position and allow fitting of any standard-depth well plates

Digital setting to adjust the speed to suit the application: – gentle shaking to ensure that the well contents remain in situ, or more vigorous agitation for effective aeration across the surface area of each well

Easy-to-use integral electronic timer ensures accurate count-down and repeatability of time-sensitive incubations

Easy to read LED display clearly indicates time remaining on timed operation and displays actual speed (rpm) NEW!

Low voltage cord easily fits through door gaskets, allowing use in incubators, refrigerators and workstations. Safe and economical running.

Applications:

- Life-science - immunoassay, shaking ELISA plates, staining cells for flow cytometry, shaking by paramagnetic beads for RNA extraction from serum and milk, 96 well plate preparation prior to LC-MS/MS, plate shaking for library preparation, shaking plates in cold rooms
- Food & Beverage - histamine in cheese, vitamins in milk testing

Shakers – models and specifications

(all heights excl. platform)		Microplate shaker
		PMS-1000i
		 h: 90 mm d: 205 mm w: 220mm weight: 2 kg
Speed	rpm	150 to 1200
Orbit	mm	2
Capacity	microplates	2 or 4*
Timer, with automatic switch-off		1 min to 23 h 59 min
Display		4 digit LED
Input voltage	V dc	12
Input current	A	0.28
Ambient temperature range	°C	4 to 40

Accessories

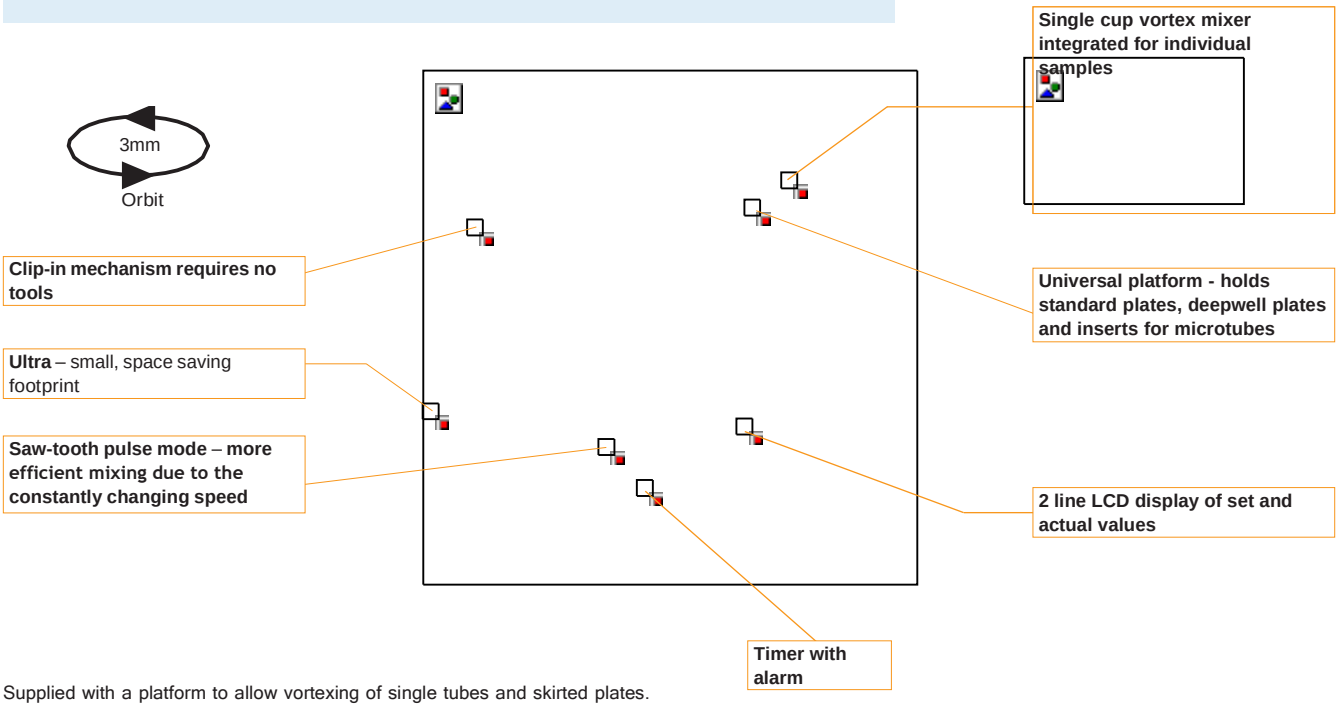
MPP4 *
Platform for four plates
available as an option

MPS-1 high speed shaker/vortex mixer for plates and microtubes

An economical solution that takes up very little bench space, for all high-speed shaking and vortex mixing of plates and tubes from 0.2ml through to 50ml all-in-one. Efficient mixing of difficult samples - compact pellets, small or viscous samples.

2 year warranty

- **Versatile for single tube vortex to shaking of microplates, PCR plates, microtubes and deepwell plates**
- **Mixing of 0.2ml to 50ml microtubes at high speed**
- **Saw-tooth pulse mode**
- **Very small footprint**
- **Safe in humid environments due to low voltage 12V power supply**
- **Quiet < 50dBA**
- **Can be used at temperatures from +4ºC to 40ºC**
- **Adjustable rpm or 4 presets**
- **Grant renowned technical and service support**



Supplied with a platform to allow vortexing of single tubes and skirted plates.

Additional inserts for microtubes available.

Markets: Education, research, QC, QA, R&D, Biopharm and healthcare

Applications: Life science applications, molecular biology, cell biology, cell lysis, DNA isolation and purification, sample preparation for PCR, pellent re-suspension, mixing viscous liquids, multiple microtube mixing

MPS-1 specifications

		High-speed mixer shaker/vortex MPS-1
		 4.7 kg h: 150 mm d: 220 mm w: 234 mm
Mixing speed control range	rpm	300 - 3200
Speed control increment	rpm	100
Mixing presets VORTEX HARD MEDIUM SOFT CUSTOM PULSE MODE	rpm	 3200 2600 1800 1000 Adjustable Saw tooth profile of ramp speed cycles
Mixing orbit	mm	3
Acceleration time	sec	5
Timer, with audible alarm	min	1 to 60 min / non-stop
Operating temperature	°C	+4 to 40
Maximum noise	dBA	50
Input current / power consumption		Low voltage 12V, 800mA / 10W
Types of vessels		Microplate U, V or flat bottom PCR plate 96 or 384 well fully / semi / unskirted Deepwell plate 250µl to 2000µl Microtubes 0.2, 0.5, 1.5, 2.0ml 0.2ml strips Tubes 2 to 50ml

Accessories

	**MPS-1K kit contains:** MPS-1 with 4 additional inserts shown below	
	**P-2-24** Microtube insert for 24 x 1.5/2.0ml tubes	•
	**P-05-32** Microtube insert 32 x 0.5ml tubes	•
	**P-02-05** Microtube insert for 24 x 0.5ml PLUS 48 x 0.2ml tubes or 8 x 0.2ml strips	•
	**P-02-96** Microtube insert for 96 x 0.2ml tubes or 12 x 0.2ml strips or 96 well semi / unskirted PCR plates	•

V-32 multi vortex mixer

Versatile multi vortex mixer for vigorous re-suspension of cell or chemical pellets in tubes up to 1.5 ml, with the facility to mix individual tubes up to 15 ml.

- **Adjustable speed control: 500 to 3000 rpm**
- **'Continuous' or 'quick' operation**
- **Handles up to 32 tubes in three different sizes/ combinations or a larger tube with the single platform head**

The 32-socket universal platform PV-32 and single tube platform PL-1 included as standard

PV-32 for three tubes sizes (16 x 1.5 ml, 8 x 0.5 ml, 8 x 0.2 ml)

PL-1 for mixing individual tubes up to 15 ml provides maximum flexibility

Optional 6 x 10 ml platform available

2 mm

Orbit

Compact rugged design plus powerful motor delivering consistent performance and quiet operation – fits neatly and unobtrusively into the workspace

Low voltage cord easily fits through door gaskets, allowing use in incubators, refrigerators and workstations

Easy operation – select 'continuous' or 'touch' operation and dial to control speed from 500 rpm to 3000 rpm

Rubber suction pads hold tight to the work surface and prevent the unit from 'walking' – they also absorb vibration and prevent its transmission to the workbench

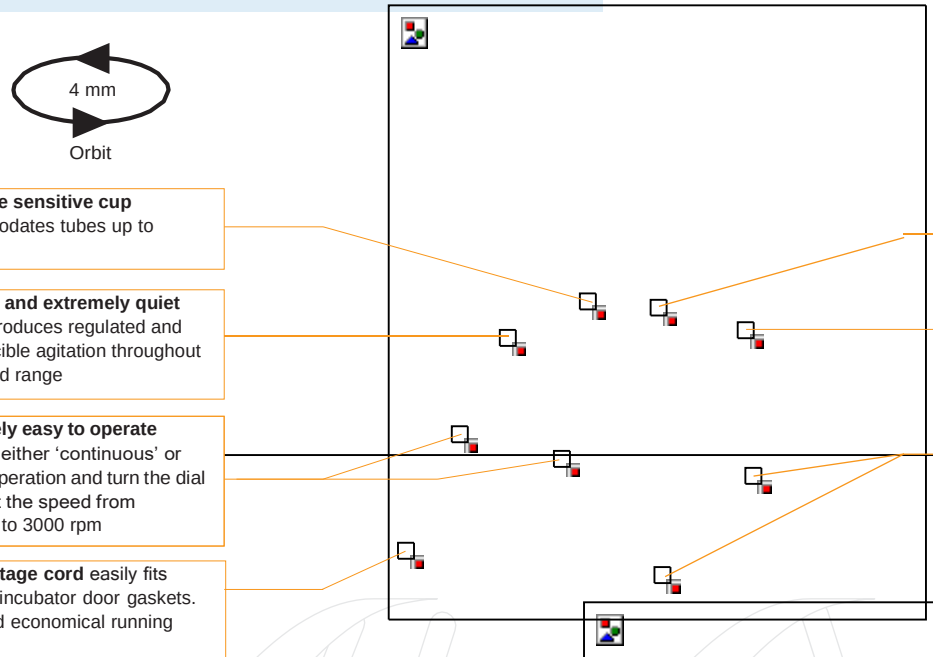
Applications:

- Life-sciences - performing various DNA operations — deproteinisation of DNA/protein complexes, mixing of immunostained human cells, purification of low-molecular DNA/RNA fragments in PCR-diagnostic
- Industrial - de-airing adhesive
- General - mixing and dispersion of particle suspensions
- Biopharm - solubilising powders

PV-1 personal vortex mixer

Extremely compact personal vortex mixer with a low profile and small footprint for gentle mixing through to vigorous re-suspension of cell or chemical pellets in up to 50 ml tubes.

- **Adjustable speed control: 750 to 3000 rpm**
- **'Continuous' or 'touch' operation**
- **For tubes up to 28.5 mm diameter, 50ml**



Pressure sensitive cup accommodates tubes up to 50 ml

Reliable and extremely quiet motor produces regulated and reproducible agitation throughout the speed range

Extremely easy to operate – select either 'continuous' or 'touch' operation and turn the dial to adjust the speed from 750 rpm to 3000 rpm

Low voltage cord easily fits through incubator door gaskets. Safe and economical running

In 'touch' mode, agitation starts in response to pressure on the pressure sensitive cup

Exceptionally compact with a low profile and small footprint - fits into almost any location

Rubber suction pads hold tight to the work surface and prevent the unit from 'walking' – they also absorb vibration and prevent its transmission to the workbench

Applications:

- Gentle mixing through to vigorous resuspension of cells and biological and chemical liquid components

Vortex mixers – models and specifications

● = standard

		Personal vortex mixer	Multi vortex mixer
		PV-1	V-32
		 h: 80 mm d: 150 mm w: 90 mm weight:1.1kg	 h: 100 mm d: 180 mm w: 120 mm weight:1.5 kg
Speed	rpm	750 to 3000	500 to 3000
Acceleration time to maximum speed	sec	–	3
Orbit	mm	4	2
Maximum tube diameter	mm	28.5*	16
Capacity		1 up to 50 ml tube	16 x 1.5 ml, 8 x 0.5 ml and 8 x 0.2 ml tubes
Input voltage	V dc	12	
Input current	A	0.32	0.32
Ambient temperature range	°C	+4 to 40	

Accessories

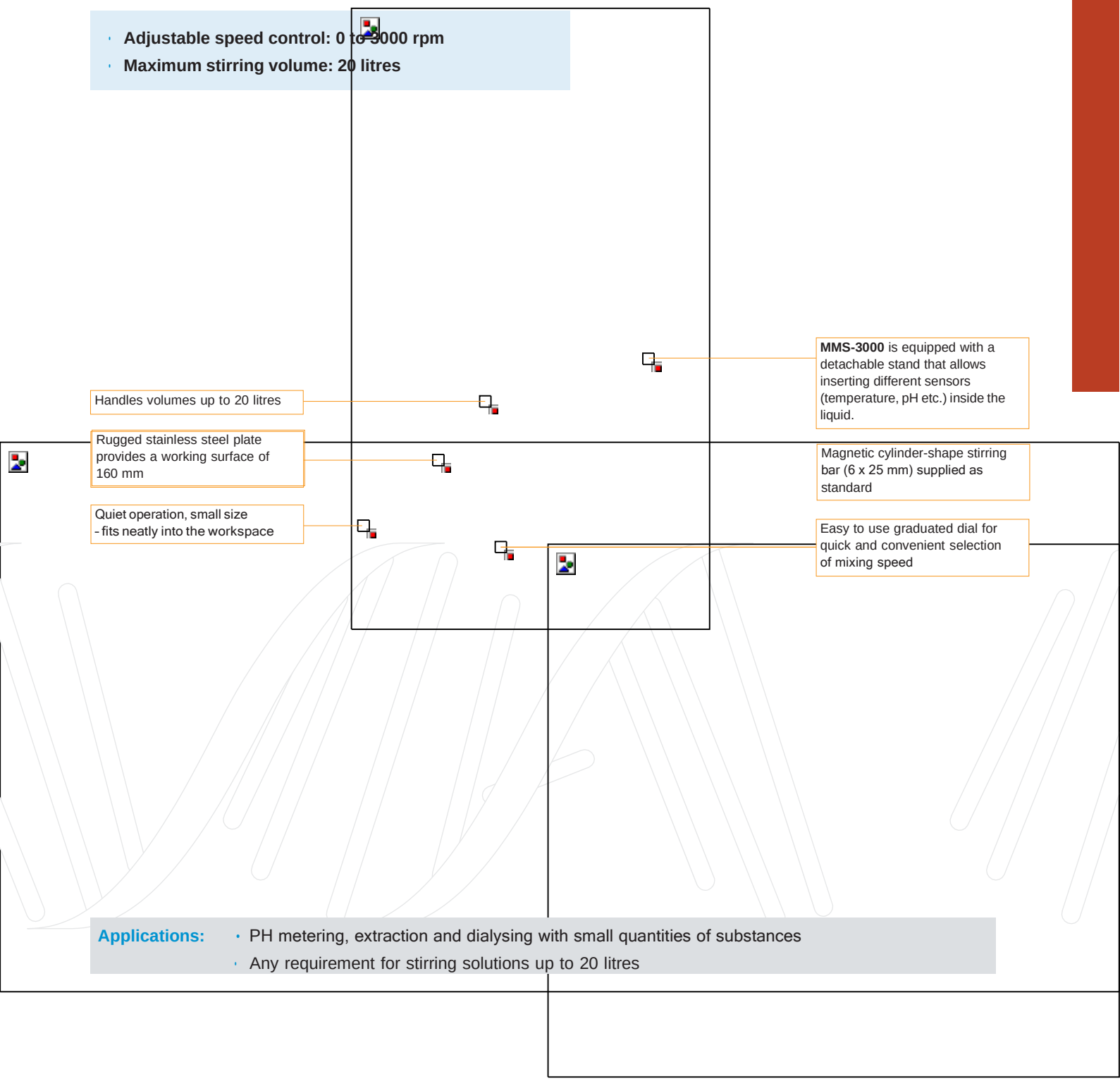
PV6-10 Universal 6-socket platform for 10 ml tubes (maximum tube diameter 15 mm)	–	●
PV-32 replacement platform (16 x 1.5 ml, 8 x 0.5 ml, 8 x 0.2 ml)	–	●

* The PV-1 takes conical tubes up to 50 ml

MMS-3000 mini magnetic stirrer

Compact magnetic stirrer for routine laboratory procedures.

- **Adjustable speed control: 0 to 3000 rpm**
- **Maximum stirring volume: 20 litres**



MMS-3000 is equipped with a detachable stand that allows inserting different sensors (temperature, pH etc.) inside the liquid.

Handles volumes up to 20 litres

Rugged stainless steel plate provides a working surface of 160 mm

Quiet operation, small size - fits neatly into the workspace

Magnetic cylinder-shape stirring bar (6 x 25 mm) supplied as standard

Easy to use graduated dial for quick and convenient selection of mixing speed

Applications:

- PH metering, extraction and dialysing with small quantities of substances
- Any requirement for stirring solutions up to 20 litres

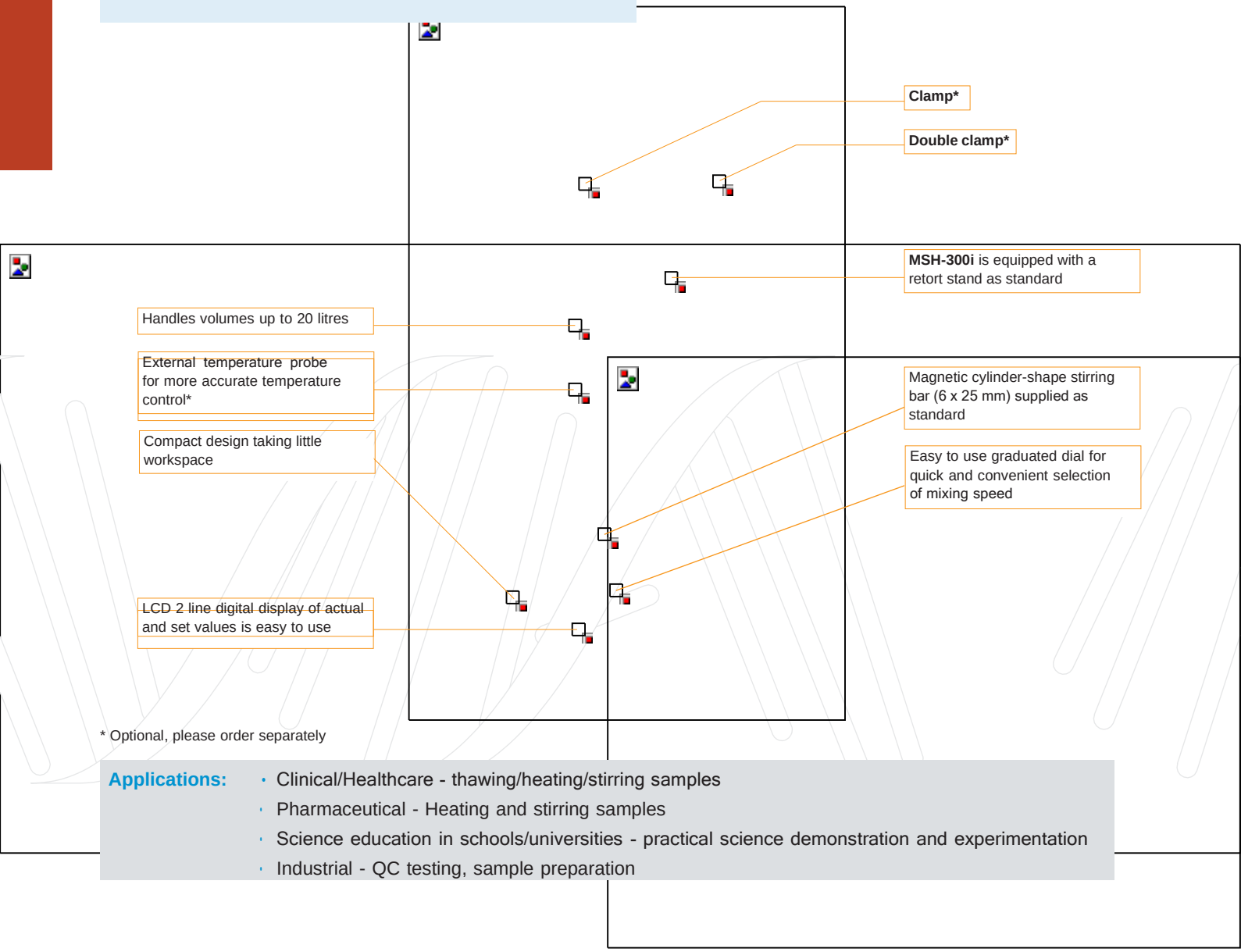
Stirrers – models and specifications

		MMS-3000
		Mini magnetic stirrer
		 h: 75 mm d: 230 mm w: 185 mm weight: 1.5 kg
Ambient temperature range	°C	+4 to 40
Speed	rpm	0 to 3000
Liquid stirring viscosity	mPa	Up to 1170
Stirring volume	L	20
Plate dimensions	mm	ø160
Input voltage	V dc	12
Input current	A	0.3

MSH-300i digital magnetic stirrer hotplate

Digital magnetic stirrer with heating; the MSH-300i Intelli-stirrer is designed for laboratories with higher requirements. It offers digital setting and control of temperature and rotation speed. A powerful magnet allows mixing solutions with glycerine viscosity level. Maximum volume of stirred liquid is 20 litres.

- **Adjustable speed control: 100 to 1250 rpm**
- **Maximum stirring volume: 20 litres**
- **2 year warranty, Grant renowned technical and service support**
- **Stirrer bar and retort stand included as standard**



* Optional, please order separately

Applications:

- Clinical/Healthcare - thawing/heating/stirring samples
- Pharmaceutical - Heating and stirring samples
- Science education in schools/universities - practical science demonstration and experimentation
- Industrial - QC testing, sample preparation

Stirrers – models and specifications

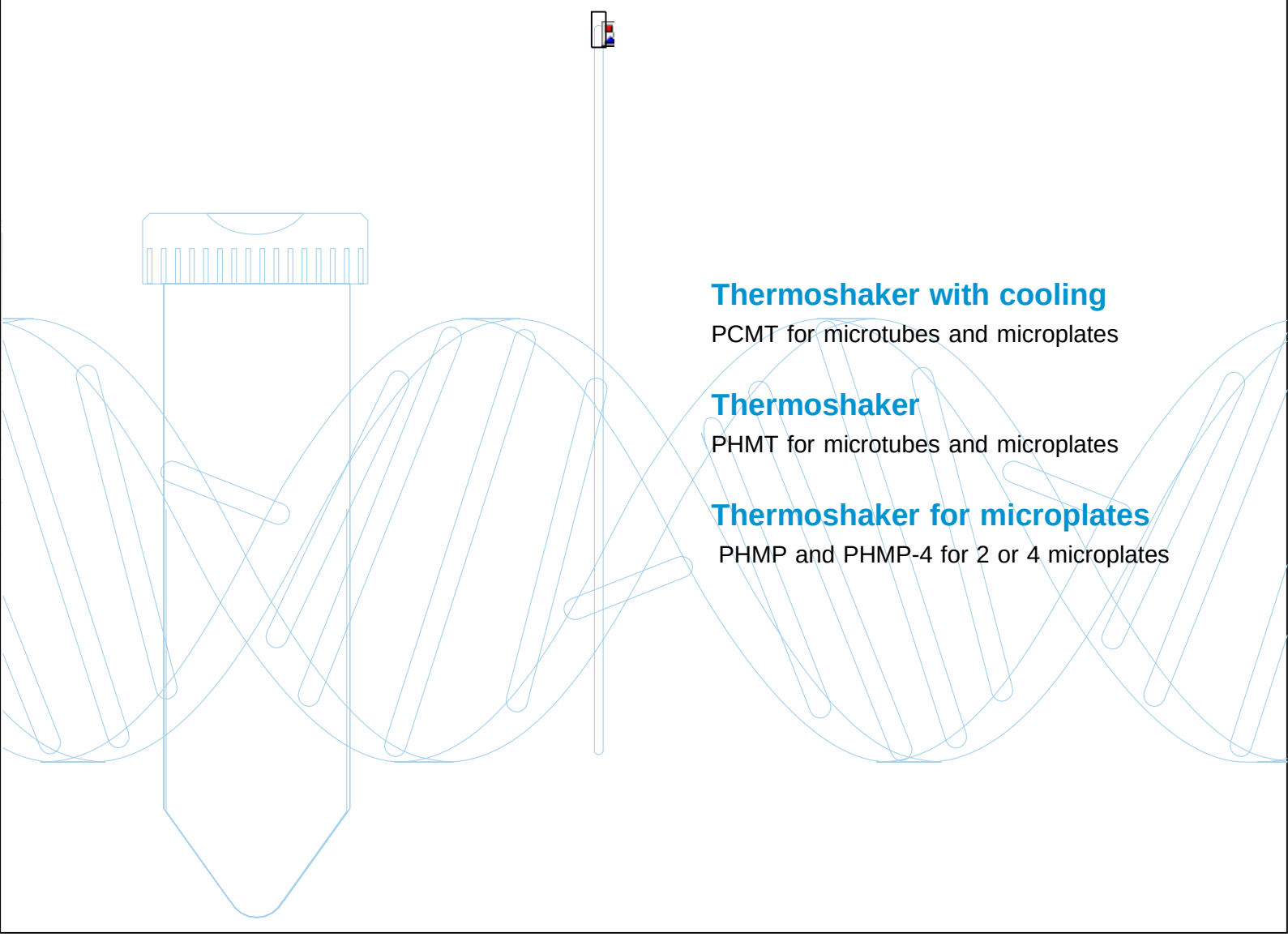
● = option

		MSH-300i
		Digital magnetic stirrer hotplate
		 h: 100 mm d: 270 mm w: 190 mm weight: 3.2 kg
Mixing speed control range	rpm	250 to 1250
Maximum stirring volume (H_2O)	Litres	20
Temperature range	ºC	+30 to 330
Temperature uniformity	ºC	±3
Plate diameter	mm	160
Plate material		Aluminium alloy
Retort stand height	mm	320
Maximum length of stirring	mm	50
Heating power	W	550

Accessories

DPMD Double clamp	●
MSH-EP External temperature probe	●
SKM2 Clamp	●

10 Thermoshakers



Thermoshaker with cooling

PCMT for microtubes and microplates

Thermoshaker

PHMT for microtubes and microplates

Thermoshaker for microplates

PHMP and PHMP-4 for 2 or 4 microplates

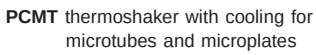
Thermoshakers

A range of compact, efficient and highly versatile thermoshakers, with excellent temperature uniformity, ideal for applications requiring heating/cooling and shaking in microplates and microtubes. Suitable for use in cold rooms and incubators (operating temperature range +4°C to +40°C).

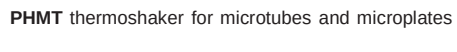
By combining the mixing operation with heating/cooling, reaction process times and operator workload are reduced and the efficiency of many procedures is increased, resulting in a higher throughput.

- Thermoshaker with cooling for microtubes, microplates and PCR plates - PCMT
- Thermoshakers for microplates and PCR plates - PHMP
- Thermoshaker for microtubes, microplates and PCR plates - PHMT
- Thermoshaker for deep well plates - TS-DW

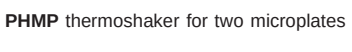
2 year warranty



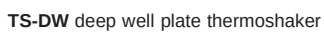
PCMT thermoshaker with cooling for microtubes and microplates



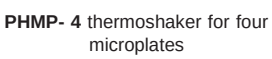
PHMT thermoshaker for microtubes and microplates



PHMP thermoshaker for two microplates



TS-DW deep well plate thermoshaker



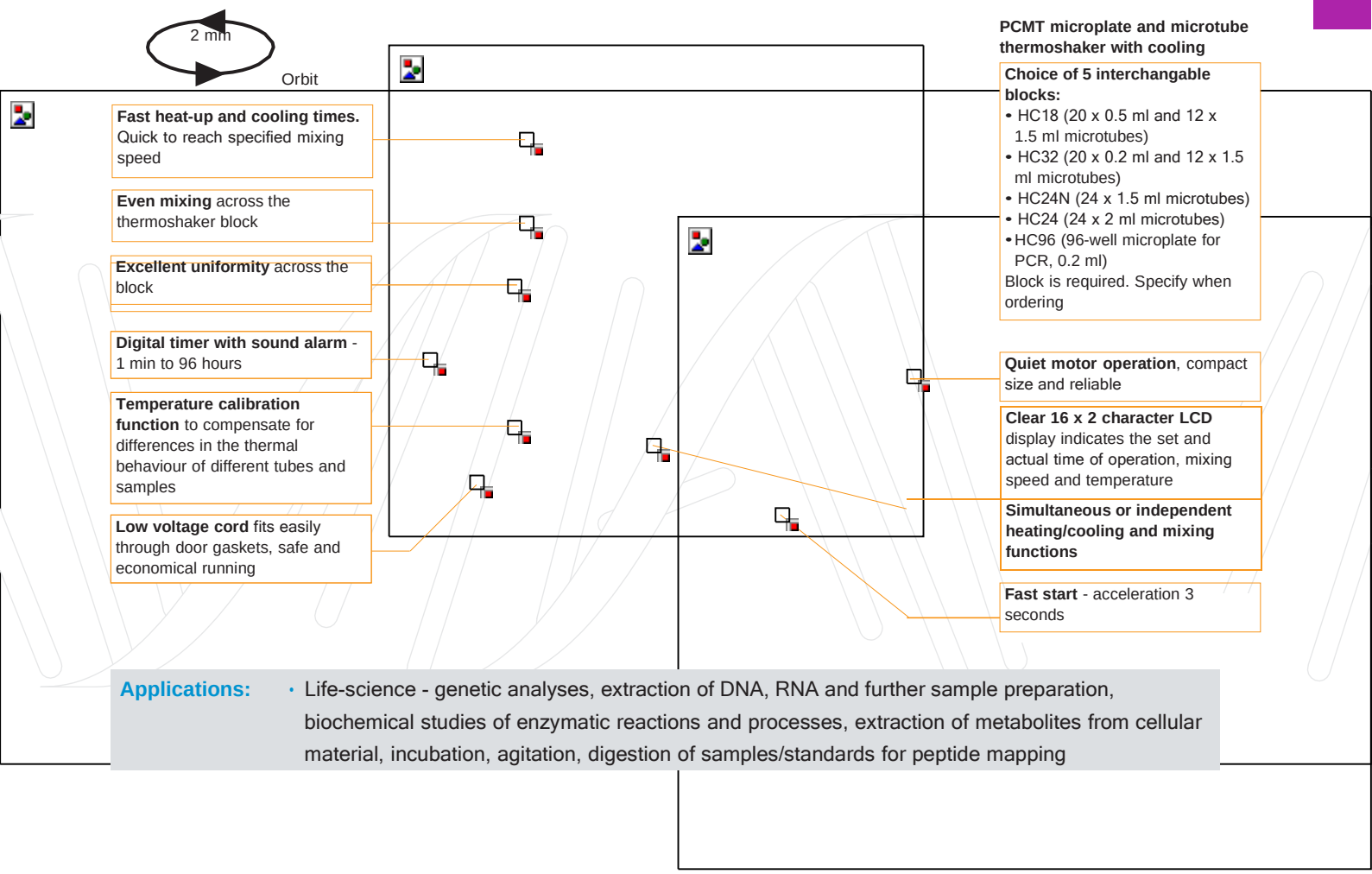
PHMP- 4 thermoshaker for four microplates

PCMT – thermoshaker with cooling for microtubes and PCR plates

Variable speed and temperature, heating and cooling thermoshaker with a choice of blocks for microtubes and microplates.

- A microtube and microplate thermoshaker
- A compact benchtop incubator
- A microtube and microplate shaker

- **Fast heat-up and cooling times**
- **Temperature setting range +4˚C to 100˚C**
- **Temperature control range ambient -15˚C to +100˚C**
- **Shaking speed: 250 to 1400 rpm**
- **Temperature stability ±0.1˚C**
- **Improved fast start 3s to maximum shaking speed**
- **Temperature calibration function**



Applications: • Life-science - genetic analyses, extraction of DNA, RNA and further sample preparation, biochemical studies of enzymatic reactions and processes, extraction of metabolites from cellular material, incubation, agitation, digestion of samples/standards for peptide mapping

Thermoshakers with cooling - models and specifications

● = option

		Microplate and microtube thermoshaker
		PCMT
		 h: 130 mm d: 230 mm w: 205 mm weight: 4 kg
Temperature setting range	°C	+4 to 100
Temperature control range		15°C below ambient to +100°C
Temperature uniformity over the block		@4°C ±0.6°C / @37°C ±0.1°C / @100°C ±0.3°C
Temperature display		2 line x 16 character LCD
Average heat up speed		5˚C / min from +25°C to +100°C (HC15 block)
Average cooling speed (HC15 block)	from +100°C to +25°C @+25°C to +4°C	5˚C / min (~ 15 mins) 1.8˚C / min (~ 8 mins)
Capacity	microtubes	see accessories below
Capacity	microplates	1
Shaking speed	rpm	250 to 1400
Orbit diameter	mm	2
Timer (with auto-off and audible alarm)		1 min to 96 hours (1 min increment)
Heating / cooling power	W	60
Input voltage	V dc	12
Input current	A	4.16
External power supply	V	100-240
Maximum noise	dba	53.8

Accessories

HC18 interchangeable block for 20 x 0.5 ml microtubes plus 12 x 1.5 ml microtubes		●
HC24N interchangeable block for 24 x 1.5 ml microtubes		●
HC24 interchangeable block for 24 x 2.0 ml microtubes		●
HC32 interchangeable block for 20 x 0.2 ml microtubes plus 12 x 1.5 ml microtubes		●
HC96 interchangeable block for 96-well microplates (0.2 ml)		●

Note: PCMT unit supplied without a block, please order from above.

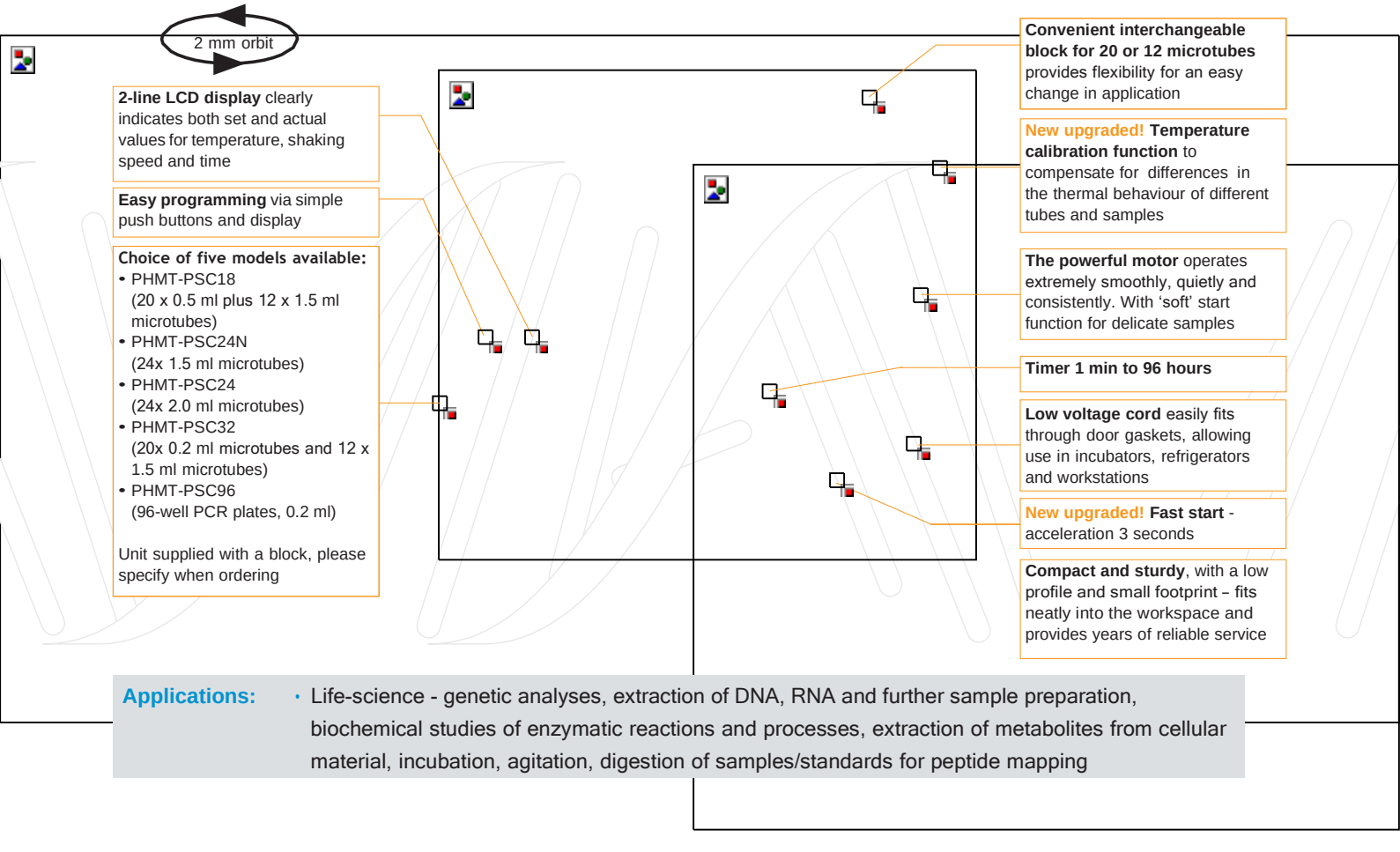
PHMT - thermoshaker for microtubes and PCR plates

Variable speed, variable temperature thermoshaker combining three instruments in one for maximum versatility and efficiency:

- A microtube and microplate thermoshaker
- A compact benchtop incubator
- A microtube and microplate shaker in cold or ambient temperatures

- **Capacity for up to 24 or up to 32 microtubes or PCR 96 well plate**
- **Temperature setting range: +25°C to100°C**
- **Temperature control range: +5°C above ambient to 100°C**
- **Shaking speed: 250 to 1400 rpm**
- **Rapid heat-up speed**
- **Continuous or timed operation, with alarm and automatic switch-off facility**
- **Improved fast start 3s to maximum shaking speed**
- **Temperature calibration function**

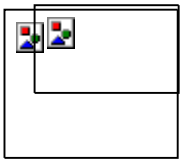
Model PHMT-PSC18 shown



Applications: • Life-science - genetic analyses, extraction of DNA, RNA and further sample preparation, biochemical studies of enzymatic reactions and processes, extraction of metabolites from cellular material, incubation, agitation, digestion of samples/standards for peptide mapping

Thermoshakers - models and specifications

● = option

	For microtubes				For microplates
	PHMT-PSC18	PHMT-PSC24N	PHMT-PSC24	PHMT-PSC32	PHMT-PSC96
	 4 kg h: 130 mm d: 230 mm w: 205 mm	 4 kg h: 130 mm d: 230 mm w: 205 mm	 4 kg h: 130 mm d: 230 mm w: 205 mm	 4 kg h: 130 mm d: 230 mm w: 205 mm	 4 kg h: 130 mm d: 230 mm w: 205 mm
Temperature setting range °C	+ 25 to 100				
Temperature control range	+5°C above ambient to 100°C				
Temperature uniformity over the block	@ +37°C ±0.1°C @ +60°C ±0.2°C @ +100°C ±0.2°C				
Display	2 line x 16 character LCD				
Heat up speed RT to 100°C	4°C/min				
Capacity	32 microtubes 20 x 0.5 ml and 12 x 1.5 ml	24 x 1.5 ml microtubes	24 x 2.0 ml microtubes	32 microtubes 20 x 0.2 ml and 12 x 1.5 ml	96-well PCR plate
Shaking speed rpm	250 to 1400				
Orbit diameter mm	2				
Timer	1 min to 96 hours (1min increment)				
Weight kg	4				
Input voltage V dc	12				
Input current A	4.16				
External power supply V	100-240				
Heating power W	42				
Maximum noise dBA	54.7				

Accessories

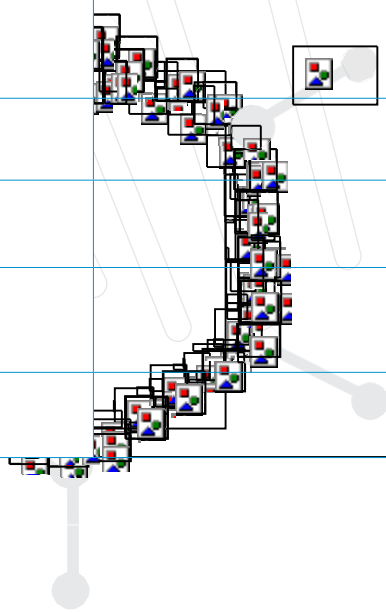
PSC18 additional / spare block
20 x 0.5 ml microtubes plus 12 x 1.5 ml microtubes

PSC24N additional / spare block
24 x 1.5 ml microtubes

PSC24 additional / spare block
24 x 2.0 ml microtubes

PSC32 additional / spare block
20 x 0.2 ml microtubes plus 12 x 1.5 ml microtubes

PSC96 additional / spare block
96-well microplates (0.2 ml)

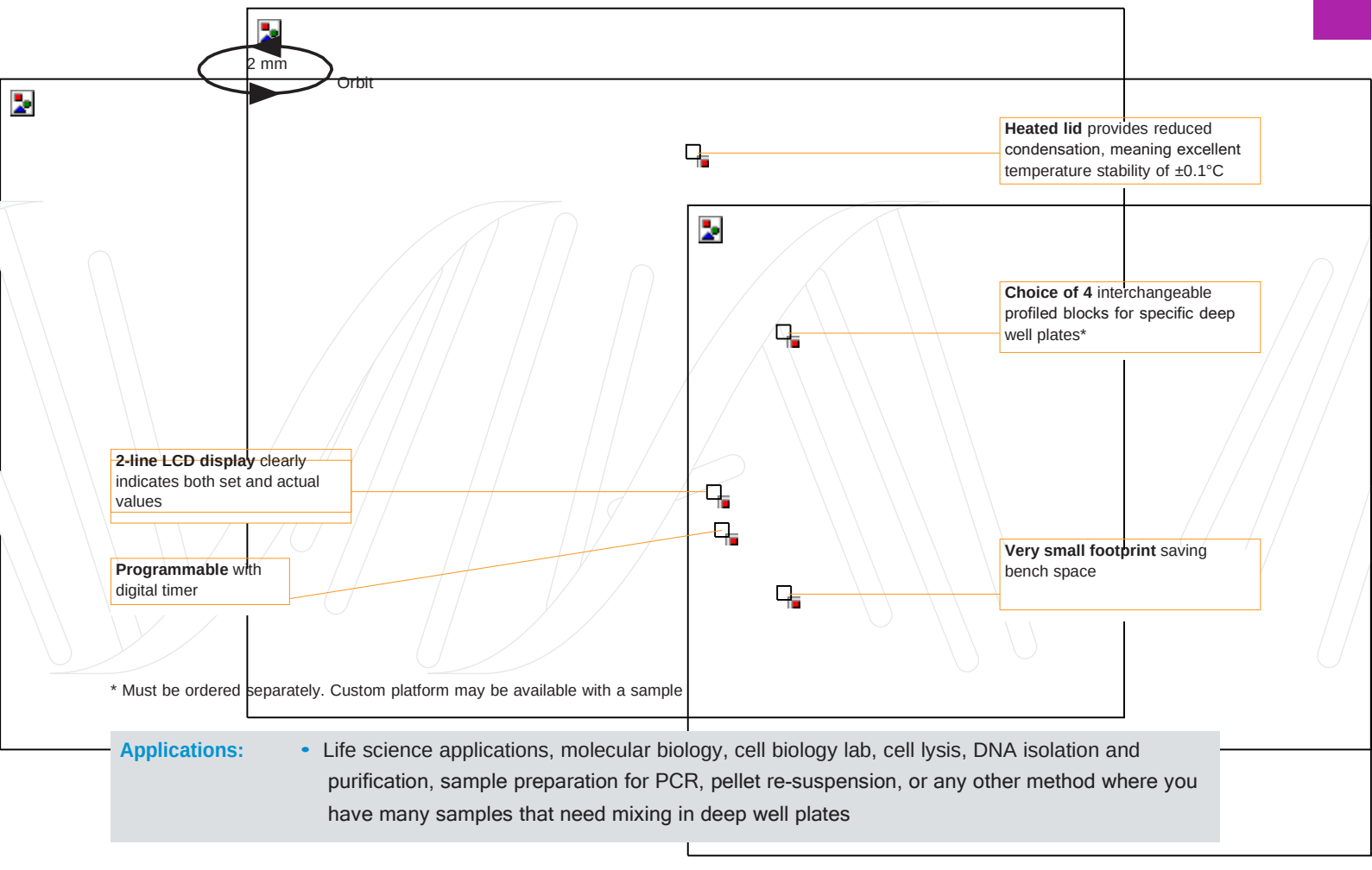


TS-DW - deep well plate thermoshaker

A thermoshaker designed for shaking and heating of deep well plates. A multisystem principle, used in design of the thermoshaker, allows it to operate as 3 independent devices:

- Incubator
- Plate shaker
- Thermoshaker

- **Profiled platform for perfect plate fit and maximum heat transfer**
- **Temperature setting range: +25°C to100°C**
- **Temperature control range: +5°C above ambient to 100°C**
- **Shaking speed: 250 to 1400 rpm**
- **Rapid heat-up speed**
- **Very small footprint**



* Must be ordered separately. Custom platform may be available with a sample

Applications:

- Life science applications, molecular biology, cell biology lab, cell lysis, DNA isolation and purification, sample preparation for PCR, pellet re-suspension, or any other method where you have many samples that need mixing in deep well plates

Stirrers – models and specifications

● = option

		TS-DW
		Deep well plate thermoshaker
		 5.1 kg h: 165 mm d: 255 mm w: 245 mm
Mixing speed control range	rpm	250 to 1400
Temperature control range	ºC	Ambient +5 to 100
Temperature setting range	ºC	+25 to 100
Mixing orbit	mm	2
Temperature uniformity	ºC	± 0.1
Temperature accuracy	ºC	± 0.5
Timer with sound alarm		1 min to 96 hrs
Heated lid		Yes
Capacity		1 deep well plate, Eppendorf®, Sarstedt®, Axygen®, Starlab®, custom*

* Must be ordered separately. Custom fit may be possible with sample

Accessories

B-2A Block for one deep well plate Axygen® 96/2200 µl	●
B-2E Block for one deep-well plate Eppendorf® 96/1000 µl	●
B-2S Block for one deep well plate Sarstedt® Megablock 96/2200 µl	●
B-2SL Block for one deep well plate Starlab® 96/1200 µl	●

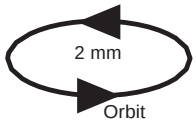
Thermoshaker PHMP, PHMP-100 and PHMP-4 for microplates

Excellent temperature uniformity across the platform/microplate (patented bi-directional heating of microplates) combined with variable speed and variable temperature produces the ideal thermoshaker for microplate incubations.

Can be used with all types of standard depth microplates and offers three devices in one for maximum versatility and efficiency:

- A microplate thermoshaker
- A compact benchtop incubator without shaking
- A microplate shaker in cold or ambient temperatures

- **Temperature setting range: +25°C to 100°C**
- **Stability ±0.1°C, uniformity ±0.2°C due to the bi-directional heating system (platform and lid)**
- **Shaking speed: 250 to 1200 rpm**
- **Rapid heat-up**
- **Continuous or timed operation, with alarm buzzer and automatic switch-off facility**
- **Choice of three models with capacity for two or four microplates**
- **Patented dual heating of microplates**

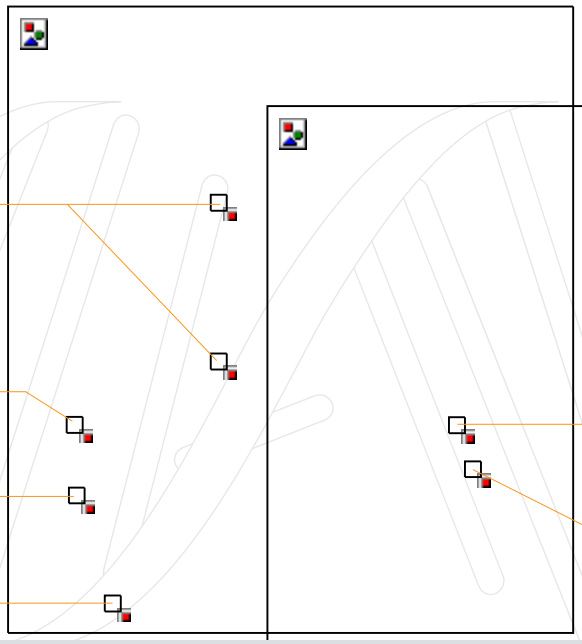


The heated lid completely covers the heating platform to provide bi-directional heating (patented) and a controlled micro-environment. This produces excellent temperature stability and uniformity, whilst preventing condensation

Display of both set and actual temperature and shaking speed

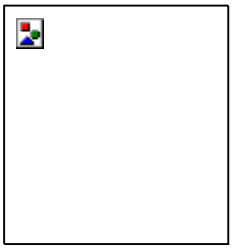
Very easy to operate, with simple set-up of temperature, shaking speed and time via push buttons and the 2-line LCD status display

Soft start/stop protects samples



Model shown PHMP thermoshaker for two microplates

The **PHMP-4** has the same functionality as the PHMP but can accommodate four microplates



The powerful, reliable motor and sturdy construction combine to provide years of consistent operation

Low voltage cord easily fits through door gaskets, allowing use in incubators, refrigerators and workstations

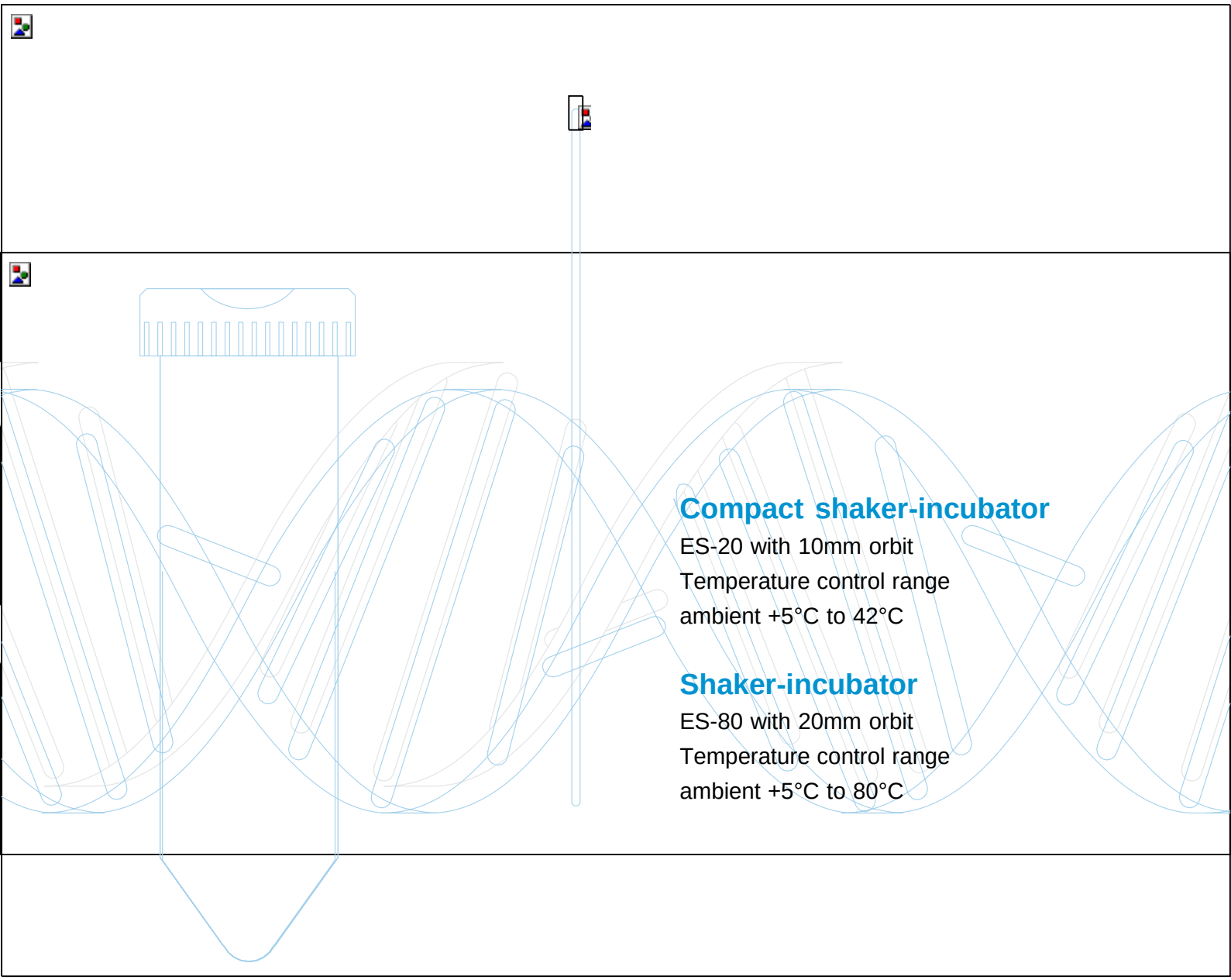
Applications:

- Cytochemistry - for in situ reactions
- Biochemistry - for enzyme and protein analysis, incubation for biomarker and protein binding assays
- Immunochemistry - for immunofermentative reaction, ELISA incubation
- Molecular biology (for microbial cell cultivation and DNA analysis)

Thermoshakers – models and specifications

	2-plate thermoshaker	2-plate thermoshaker	4-plate thermoshaker
	PHMP	PHMP-100	PHMP-4
	 h: 125 mm d: 250 mm w: 265 mm weight: 7kg	 h: 125 mm d: 260 mm w: 270 mm weight: 5.9kg	 h: 140 mm d: 390 mm w: 380 mm weight: 9kg
Temperature setting range	+25 to 60°C	+25 to 100°C	+25 to 60°C
Temperature control range	ambient +5 to 60°C	ambient +5 to 100°C	ambient +5 to 60°C
Temperature uniformity @ 37°C	±0.25°C		
Temperature stability	±0.1°C		
Temperature display	2 line x 16 character LCD		
Average heat up speed	12 minutes from 25°C to 37°C 35 minutes from 25°C to 60°C 60 minutes from 25°C to 100°C (PHMP-100 only)		
Capacity	2 microplates	2 microplates	4 microplates
Shaking speed	250 to 1200 rpm		
Speed setting resolution	increment 10 rpm		
Orbit diameter	2 mm		
Timer (with auto-off and audible alarm)	1 min to 96 hrs (1 min increment)		
Max. height of microplates	18 mm		
Weight	7 kg	5.9 kg	9 kg
Input voltage	12 V dc		
Input current	3.3 A	5 A	4.15 A
External power supply	100-240 V		

11 Orbital shaker-incubators



Compact shaker-incubator

ES-20 with 10mm orbit
Temperature control range
ambient +5°C to 42°C

Shaker-incubator

ES-80 with 20mm orbit
Temperature control range
ambient +5°C to 80°C

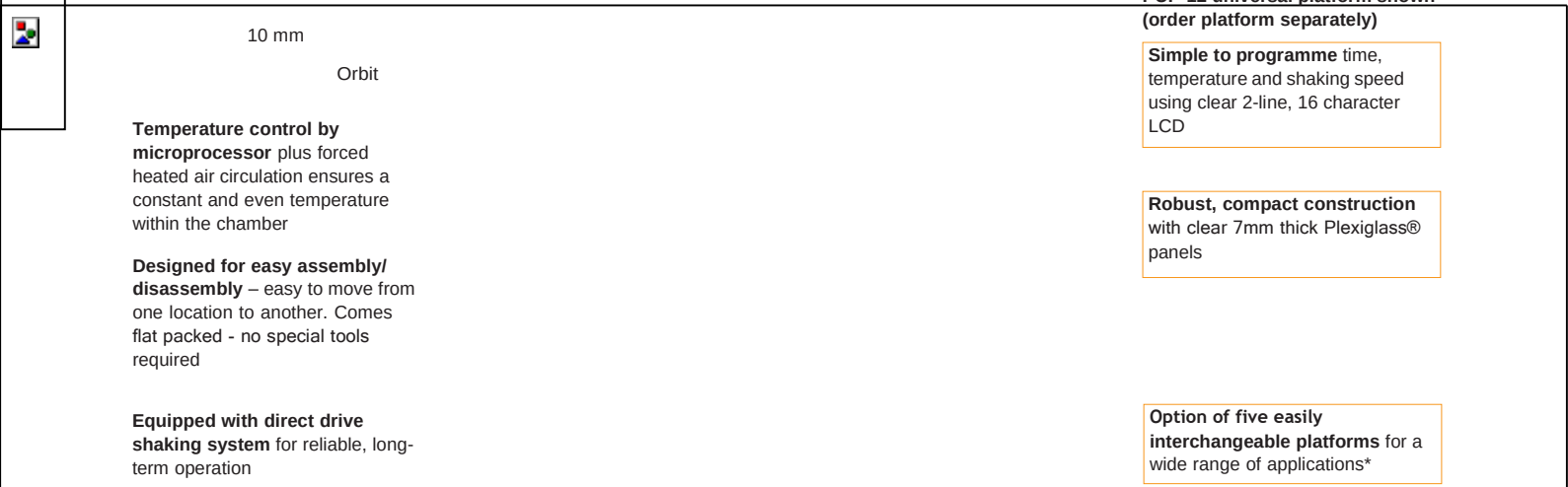
Compact shaker-incubator

ES-20

Versatile and programmable bench-top orbital shaker-incubator for mixing and incubating biological cultures and samples in a variety of flasks and vessels.

- Digital control of time, temperature and shaking speed for accuracy and repeatability
- Variable speed: 50 to 250 rpm
- Temperature setting range: +25°C to 42°C
- Load up to 2.5 kg
- Interchangeable platforms for shaking/incubating different vessels*

2 year warranty



ES-20 shaking incubator with PUP-12 universal platform shown (order platform separately)

Simple to programme time, temperature and shaking speed using clear 2-line, 16 character LCD

Temperature control by microprocessor plus forced heated air circulation ensures a constant and even temperature within the chamber

Robust, compact construction with clear 7mm thick Plexiglass® panels

Designed for easy assembly/ disassembly – easy to move from one location to another. Comes flat packed - no special tools required

Equipped with direct drive shaking system for reliable, long-term operation

Option of five easily interchangeable platforms for a wide range of applications*

* supplied without platform, please order separately

Applications:

- Life-sciences - suitable for growing cell cultures in flasks, extracting tissue samples at physiological temperatures, sample preparation processes, mixing of biological liquids as well as the incubation and cultivation of biological liquids, growing e-coli, bioluminescence preparation

Shaker-incubator

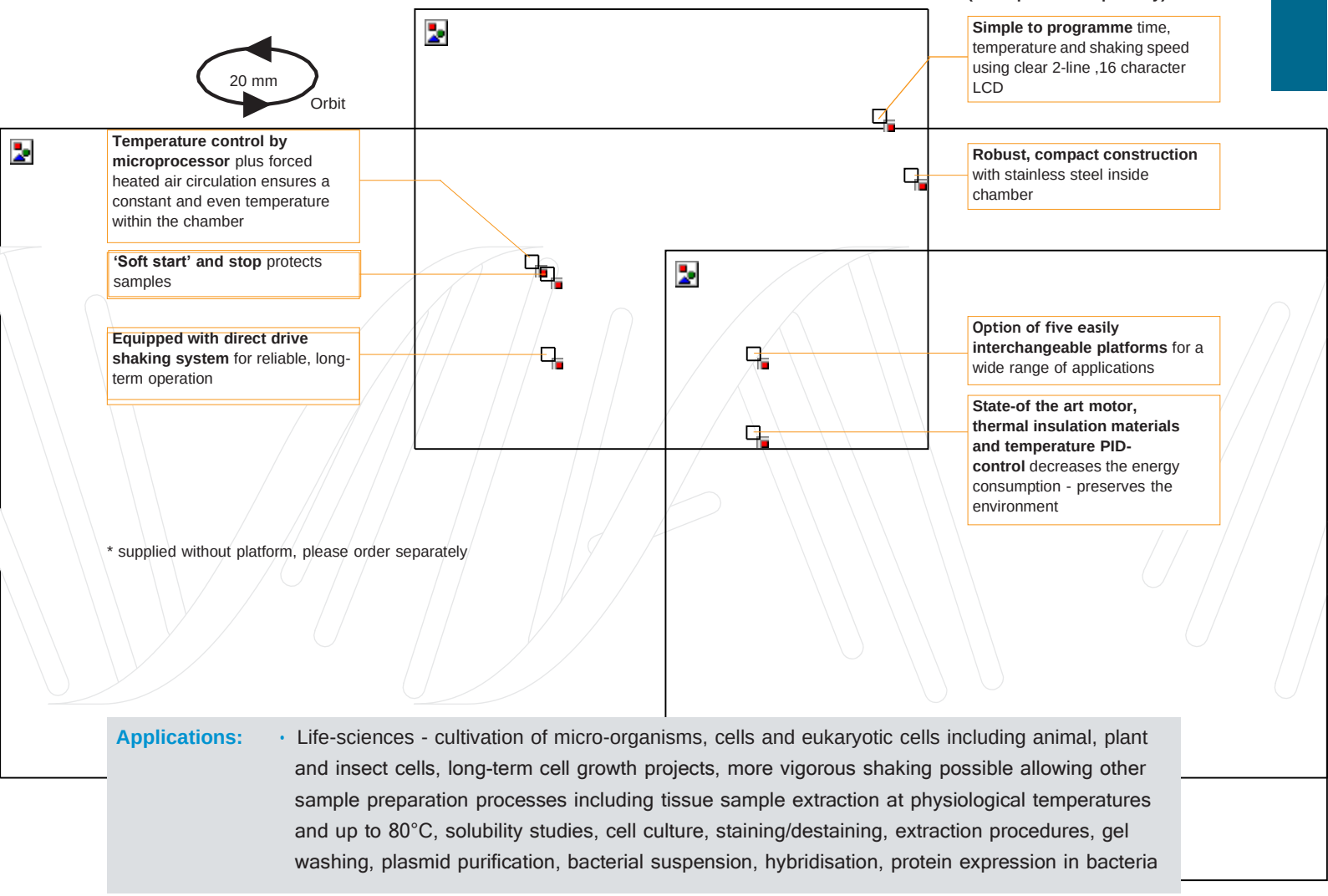
ES-80

Stable and reliable, with programmable time, temperature and shaking speed. This orbital shaker-incubator is ideal for vigorous or even mixing and incubation of samples in a variety of flasks and vessels.

- Digital control of time, temperature and shaking speed for accuracy and repeatability
- Variable speed: 50 to 250 rpm
- Temperature setting range: +25°C to 80°C
- Load up to 8 kg
- Interchangeable platforms for shaking/incubating different vessels

2 year warranty

ES-80 shaking incubator with P9-500 platform shown (order platform separately)



* supplied without platform, please order separately

Applications:

- Life-sciences - cultivation of micro-organisms, cells and eukaryotic cells including animal, plant and insect cells, long-term cell growth projects, more vigorous shaking possible allowing other sample preparation processes including tissue sample extraction at physiological temperatures and up to 80°C, solubility studies, cell culture, staining/destaining, extraction procedures, gel washing, plasmid purification, bacterial suspension, hybridisation, protein expression in bacteria

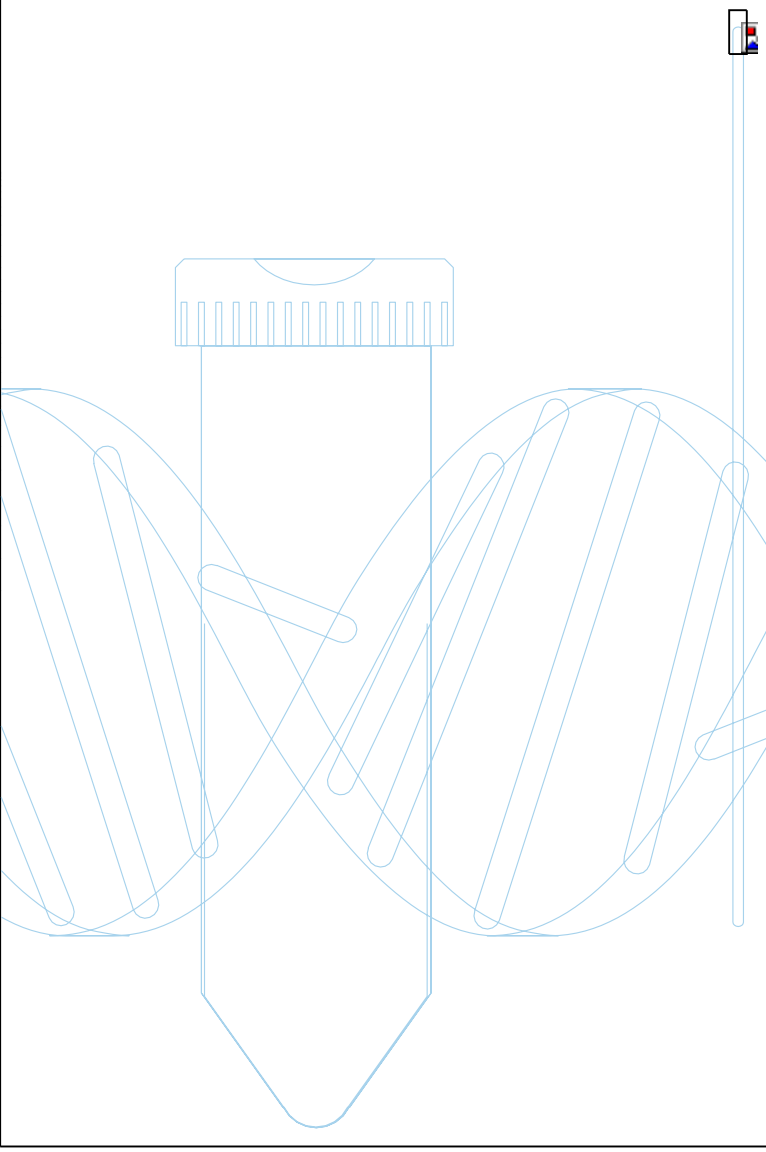
Shaking incubators – specifications

		ES-20	ES-80
		h: 435 mm d: 340 mm w: 340 mm weight: 15kg	h: 510 mm d: 525 mm w: 590 mm weight: 43kg
Speed range	rpm	50 to 250	
Stability	°C	±0.5	
Orbit	mm	10	20
Temperature setting range	°C	+25 to 42	+25 to 80
Temperature setting resolution	°C	0.1	0.1
Continuous operation		30 days (720 hours)	168hrs
Timer		1 min to 96 hours	
Load capacity	kg	2.5	8
Internal working dimensions (with installed platform) (d x w x h) cm		26 x 30 x 25	45 x 39 x 30
Display		2 line, 16 character LCD	2 line, 16 character LCD
Power supply	V	230 (50-60 Hz)	230 (50-60 Hz)

Accessories

P12-100 Platform with clamps for 12 x 100-150 ml flasks/beakers Dimensions: 250 x 190 mm	●	–
PP4 Flat platform with non-slip rubber mat for Petri dishes and culture flasks Dimensions: 219 x 219 mm	●	–
P6-250 Platform with clamps for 6 x 250-300 ml flasks/beakers Dimensions: 250 x 190 mm	●	–
PUP-12 Universal platform, with adjustable bars. Dimensions: 270 x 195 mm HB-200 extra holding bars	●	–
P16-88 Platform with spring holders for up to 88 tubes, 30mm diameter	●	–
PP-400 Flat platform with non-slip rubber mat (360 x 400mm)	–	●
P30-100 Platform with clamps for 30 x 100-150 ml flasks	–	●
P16-250 Platform with clamps for 16 x 250-300 ml flasks	–	●
P9-500 Platform with clamps for 9 x 500 ml flasks	–	●
P6-1000 Platform with clamps for 6 x 1000 ml flasks ml	–	●

12 Centrifuges and combined vortex mixer / centrifuges



Benchtop centrifuges

LMC-3000 low speed benchtop centrifuge

Combined vortex mixer / centrifuge

PCV-2400 fixed speed micro centrifuge / vortex mixer, 2800rpm

PCV-3000 variable speed micro centrifuge / vortex mixer, max. 3500 rpm

PCV-6000 variable speed micro centrifuge / vortex mixer, max. 6000 rpm

High speed microcentrifuge

Microspin 12, variable speed 100-14,500 rpm

Centrifuges

A focused range of compact, modern benchtop centrifuges for a variety of biomedical, biochemical and life-science applications requiring centrifuging or a combination of centrifuging and vortex mixing or shaking for microtubes and microplates.

- General purpose low speed centrifuge
- Combined centrifuges/vortex mixers
- All-in-one PCR centrifuge / vortex
- High speed microcentrifuge

2 year warranty

LMC-3000

Microspin 12

CVP-2

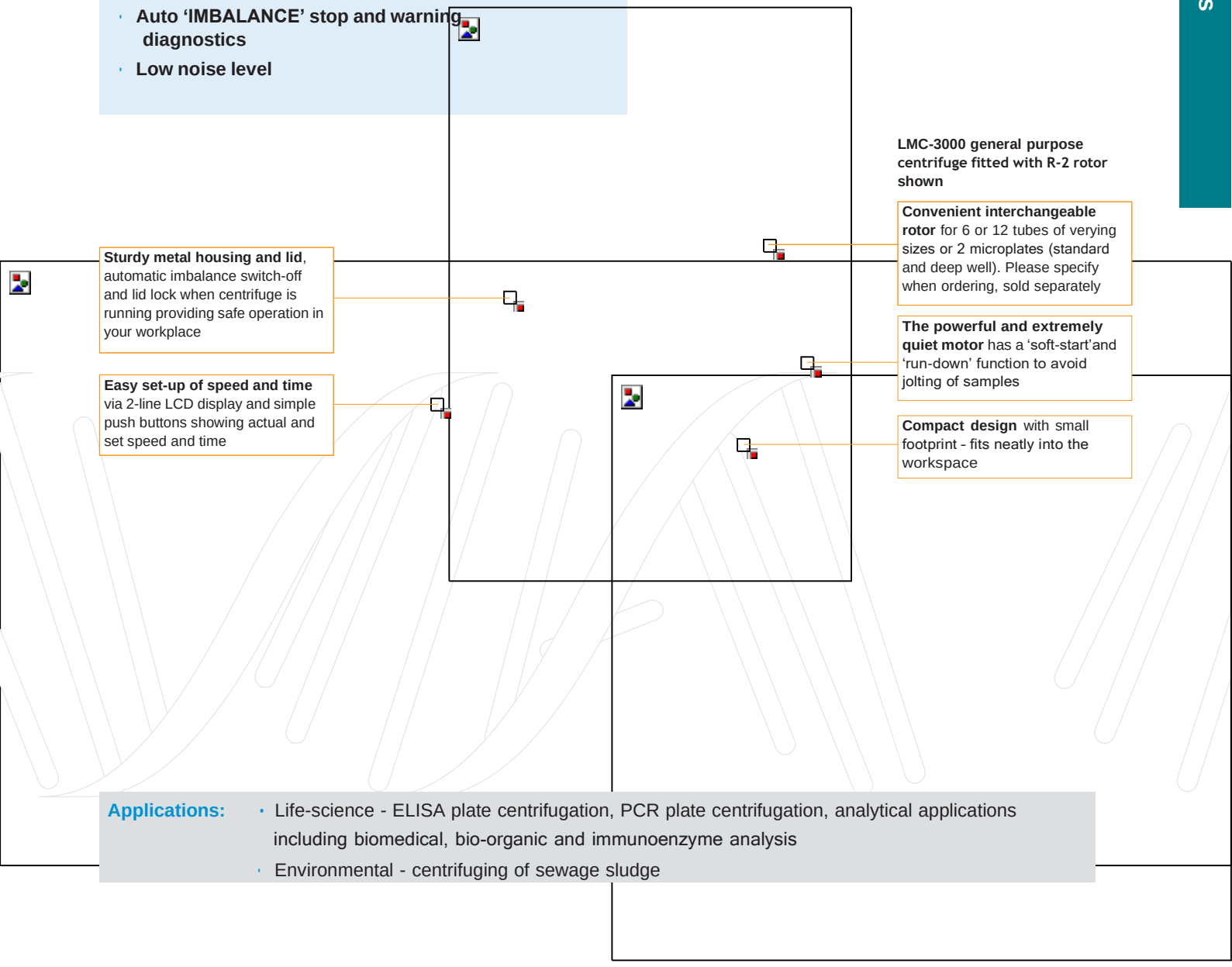
PCV-6000

PCV-2400

LMC-3000 general purpose benchtop centrifuge

Low speed benchtop centrifuge with interchangeable rotors for accommodating centrifuge tubes (from 2 to 50 ml) or microplates.

- **Spin speed: up to 3000 rpm for tubes, up to 2000 rpm for microtitre plates**
- **Timed operation (1 to 90 minutes), with automatic switch-off**
- **'Soft-start' and 'run-down' of the rotor**
- **Choice of interchangeable rotors for up to 12 centrifuge tubes or 2 microplates**
- **Auto 'IMBALANCE' stop and warning diagnostics**
- **Low noise level**



LMC-3000 general purpose centrifuge fitted with R-2 rotor shown

Sturdy metal housing and lid, automatic imbalance switch-off and lid lock when centrifuge is running providing safe operation in your workplace

Easy set-up of speed and time via 2-line LCD display and simple push buttons showing actual and set speed and time

Convenient interchangeable rotor for 6 or 12 tubes of verying sizes or 2 microplates (standard and deep well). Please specify when ordering, sold separately

The powerful and extremely quiet motor has a 'soft-start'and 'run-down' function to avoid jolting of samples

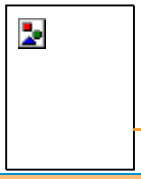
Compact design with small footprint - fits neatly into the workspace

Applications:

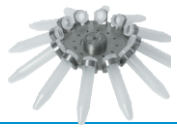
- Life-science - ELISA plate centrifugation, PCR plate centrifugation, analytical applications including biomedical, bio-organic and immunoenzyme analysis
- Environmental - centrifuging of sewage sludge

Centrifuges - models and specifications

● = optional

		Benchtop centrifuges
		LMC-3000
		low speed
		 h: 235 mm d: 420 mm w: 495 mm weight: 13.5 kg
Max RCF (bottom of tube)	g-force	1700 x g
Speed (centrifuge tubes)	rpm	100 to 3000
Max RCF microplate rotor	g-force	560 x g
Speed (microtiter plates)	rpm	100 to 2000
Centrifugation time		up to 90 minutes (1 min increment)
Speed increment	rpm	100
Chamber diameter	mm	335
Display		2 line x 16 character LCD
Input voltage	V ac	120 or 230 (50-60 Hz)
Ambient temperature range	ºC	+4 to 40
Maximum noise	dBA	59.4

Accessories

R-6 interchangeable centrifuge rotor for 6 x 50 ml tubes, with cap, conical end Dimensions: ø29 x 115 mm		●
R-12-10 interchangeable centrifuge rotor for 12 x 10 to 15 ml tubes, rounded ends, no caps Dimensions: ø16x 105 mm		●
R-12-15 interchangeable centrifuge rotor for 12 x 15 ml tubes, with cap, conical end Dimensions: ø17x 120 mm		●
R-2 interchangeable centrifuge rotor for 2 microtitre plates Dimensions: w128 x l85.6 mm Suitable for deepwell plates max dims 128 x 85.6 x 45 mm (w x d x h)		●
Adapter sets for R-12-10 (pack of 12) BN-13-75 for vacutainers 2-5 ml (ø13 x 75mm) BN-13-100 for vacutainers 4-8 ml (ø13 x 100mm) BN-16-100 for vacutainers 8-9 ml (ø16 x 100mm)		●

PCV-2400 Combi-spin™ combined centrifuge/vortex mixer

Cost-effective, fixed-speed, combined micro centrifuge/vortex mixer for combined or independent centrifuge and mixing applications of microtubes and 0.2 ml microtube strips in low volume applications.

Tubes are loaded into the rotor for simultaneous spinning, then removed for individual mixing in the vortex cup located at the top of the central shaft. In spin-mix-spin applications, the Combi-spin™ can be used with very low reagent volumes representing an overall saving in time, labour and material.

- **Centrifugation speed: fixed at 2800 rpm / 50Hz and 3500 rpm / 60Hz**
- **Continuous operation or short spin**
- **Choice of interchangeable rotors for different microtube sizes/combinations and for 0.2 ml strips**
- **Can be used at temperatures from +4ºC to +40ºC**

PCV-2400 Combi-spin™ mini centrifuge/vortex mixer

A safety interlock stops the rotor when the lid is opened to ensure you and your workplace remain safe

The vortex cup emerges through an opening in the closed lid, enabling individual tubes to be mixed even while a full load of tubes is spinning

The Combi-spin™ is supplied as standard with two interchangeable rotors for 12 x 1.5 ml and 12 x 0.5 ml + 12 x 0.2 ml microtubes

Optional accessory rotors – for 16 and 18 microtubes and for two 8 well 0.2ml strips – allow for quick and easy changes of application

Very simple to operate – use the left-hand button to select continuous or short spin

Applications:

- Life-science - genetic engineering research (for PCR-diagnostics experiments). Units can be used in microbiological, biochemical, clinical laboratories and industrial biotechnological laboratories

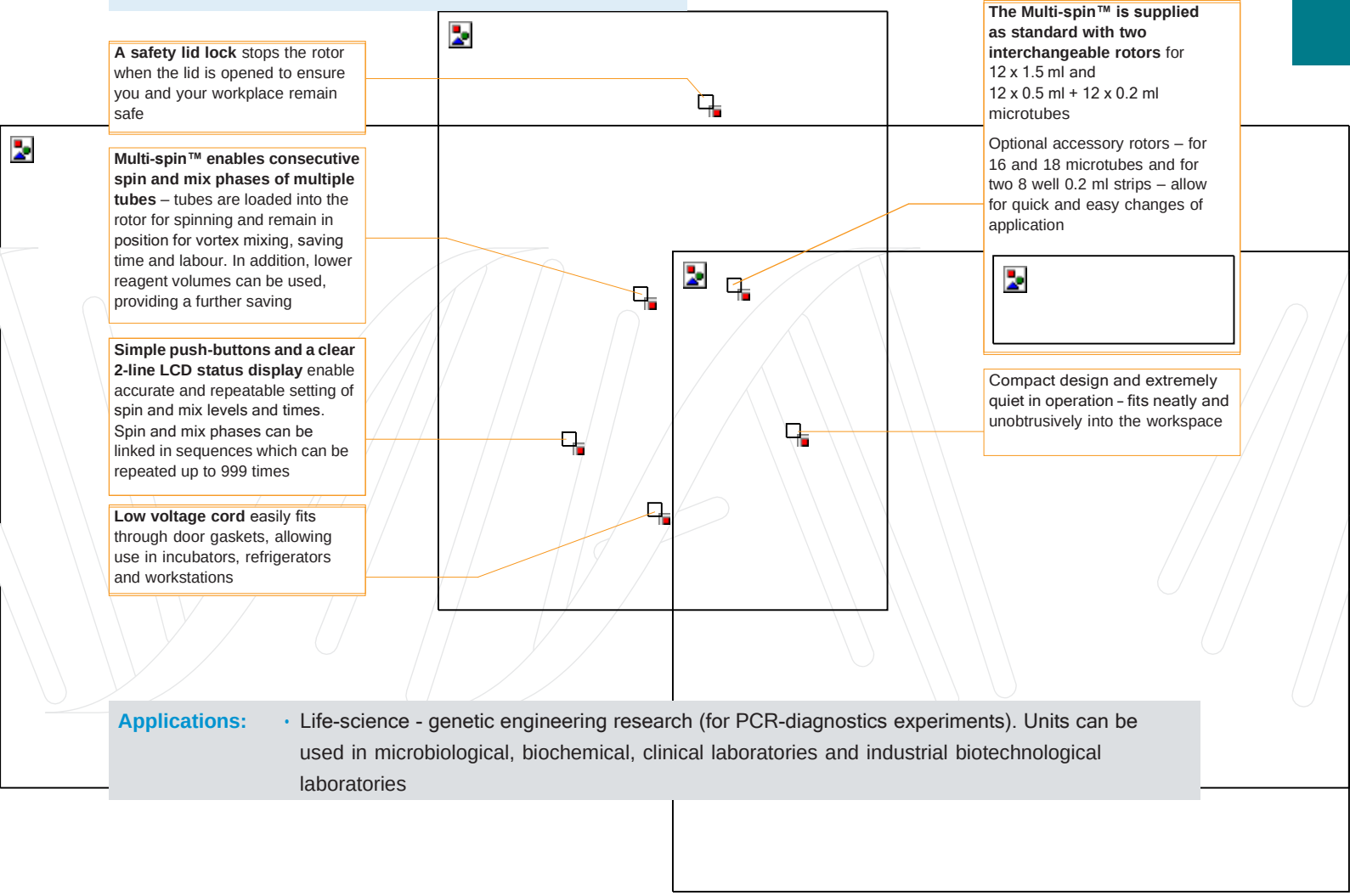
PCV-6000 Multi-spin™ combined centrifuge/vortex mixer

Highly versatile and efficient variable-speed combined centrifuge/vortex mixer. Programmed centrifugation and mix operations or independent centrifuging and vortex-mixing of multiple microtubes and 0.2 ml strips.

Spin-mix-spin technology can save considerable time by automatically performing a cycling program of sample mixing and spinning 12 tubes at once, when compared with removing the tubes for vortexing after every spin.

- **Centrifugation speed: Up to 6000 rpm**
- **Vortex mixing modes - soft, medium and hard with regulated timer of 1 to 20 seconds, with automatic switch-off**
- **Choice of interchangeable rotors for different microtube sizes/combinations and for 0.2 ml strips**
- **Can be used at temperatures from +4ºC to +40ºC**

Multi-spin™ PCV-6000 shown



A safety lid lock stops the rotor when the lid is opened to ensure you and your workplace remain safe

Multi-spin™ enables consecutive spin and mix phases of multiple tubes – tubes are loaded into the rotor for spinning and remain in position for vortex mixing, saving time and labour. In addition, lower reagent volumes can be used, providing a further saving

Simple push-buttons and a clear 2-line LCD status display enable accurate and repeatable setting of spin and mix levels and times. Spin and mix phases can be linked in sequences which can be repeated up to 999 times

Low voltage cord easily fits through door gaskets, allowing use in incubators, refrigerators and workstations

The Multi-spin™ is supplied as standard with two interchangeable rotors for 12 x 1.5 ml and 12 x 0.5 ml + 12 x 0.2 ml microtubes

Optional accessory rotors – for 16 and 18 microtubes and for two 8 well 0.2 ml strips – allow for quick and easy changes of application

Compact design and extremely quiet in operation – fits neatly and unobtrusively into the workspace

Applications:

- Life-science - genetic engineering research (for PCR-diagnostics experiments). Units can be used in microbiological, biochemical, clinical laboratories and industrial biotechnological laboratories

● = standard
● = optional

		Combined centrifuge/vortex mixer	
		PCV-2400	PCV-6000
		combi-spin, fixed speed	multi spin, variable speed
		 h: 125 mm d: 235 mm w: 190 mm weight: 2.1kg	 h: 125 mm d: 235 mm w: 190 mm weight: 2.5kg
Max RCF (bottom of tube) g-force	g	700	2350
Speed (centrifuge tubes)	rpm	2800 at 50Hz / 3500 at 60Hz	1000 to 6000
Vortex mixing intensity		–	soft, medium and hard
Spin timer, with automatic switch-off		–	1 sec to 30 mins
Mix timer, with automatic switch-off		–	1 to 20 sec (1 sec increment)
Spin-mix-spin cycle regulation		–	1 to 999 cycles
Number of tubes vortexing		1 individual	up to 12 simultaneously
Time for completing the spin-mix-spin			
	12 microtubes	5-6 min	1 min
	100 microtubes	60 min	10 min
Capacity 12 x 1.5 ml microtubes		●	●
12 x 0.5 ml plus 12 x 0.2 ml microtubes		●	●
Display		–	2 line x 16 character LCD
Input voltage	V dc	–	24 (24W, 0.9A)
	V ac	120 or 230 (50/60 Hz)	100-240 (50/60 Hz)
External power supply		-	●
Maximum noise	dBA	50	71

Accessories

PR2-05 interchangeable centrifuge rotor for 8 x 1.5/ 2.0 ml plus 8 x 0.5 ml microtubes *Optional*		●	●
PR2-05-02 interchangeable centrifuge rotor for 6 x 1.5/ 2.0 ml plus 6 x 0.5 ml plus 6 x 0.2 ml microtubes *Optional*		●	●
PSR-16 interchangeable centrifuge rotor for 2 x 8-well 0.2 ml microtube strips *Optional*		●	●
R-15 replacement rotor for 12 x 1.5 ml microtubes *Included*		●	●
R-05-02 replacement rotor for 12 x 0.5 ml and 12 x 0.2 ml microtubes *Included*		●	●

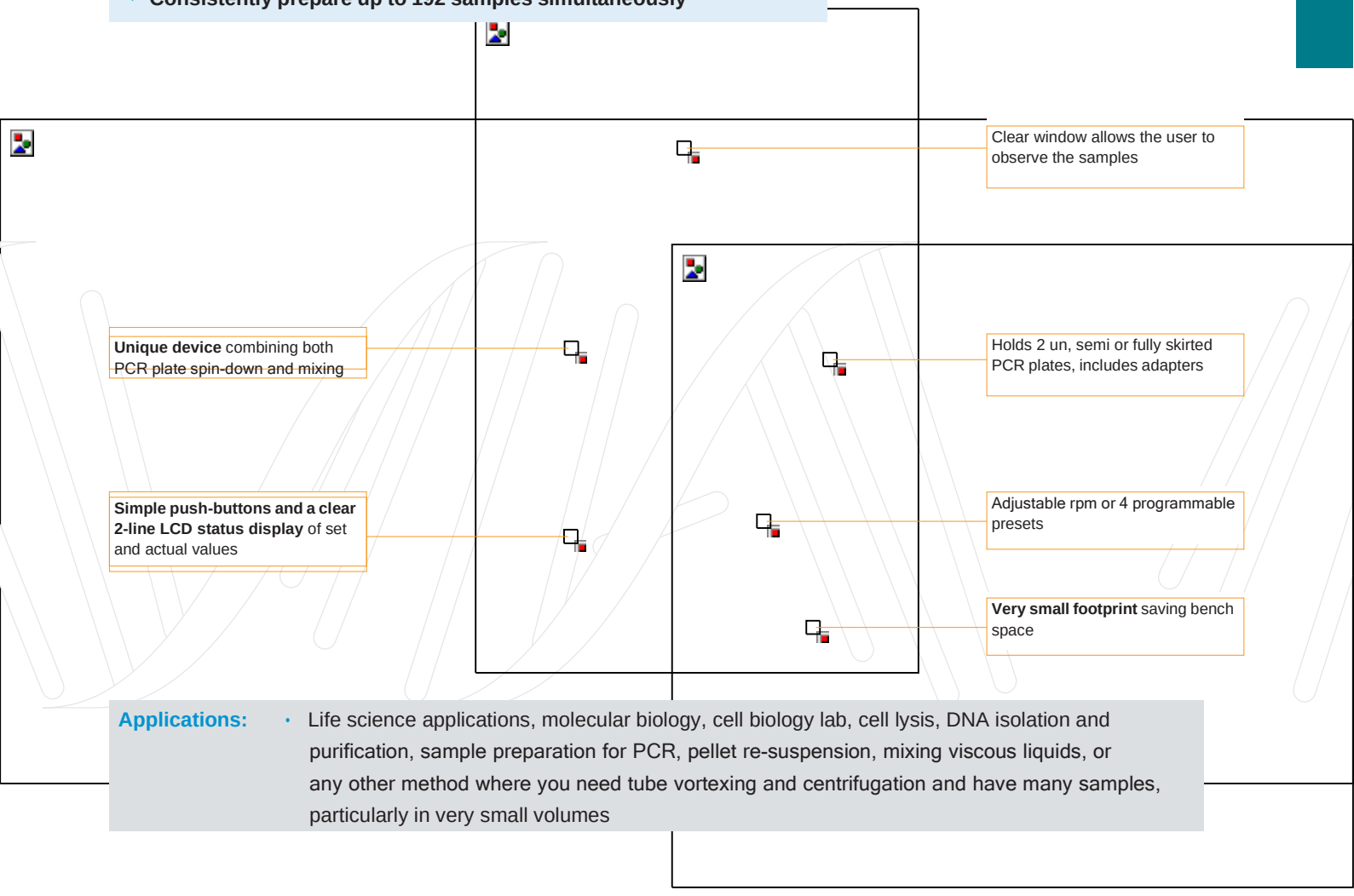
CVP-2 all-in-one PCR plate centrifuge / vortex

All-in-one PCR plate centrifuge / vortex mixer that allows for the simultaneous sample preparation of multiple samples at one time. Versatile through being able to hold un, semi and fully skirted PCR plates with no additional accessories required.

The CVP-2 offers 3 devices in one:

- Centrifuge with vortex mixing
- PCR plate centrifuge
- PCR plate mixer

- **Centrifuge and vortex mixer combined for significant time saving**
- **Centrifugation mixing speed: 300 to 1500 rpm**
- **Independent vortex and centrifuge timers with up to 999 cycles**
- **Adjustable rpm or 4 programmable presets**
- **Consistently prepare up to 192 samples simultaneously**



Applications:

- Life science applications, molecular biology, cell biology lab, cell lysis, DNA isolation and purification, sample preparation for PCR, pellet re-suspension, mixing viscous liquids, or any other method where you need tube vortexing and centrifugation and have many samples, particularly in very small volumes

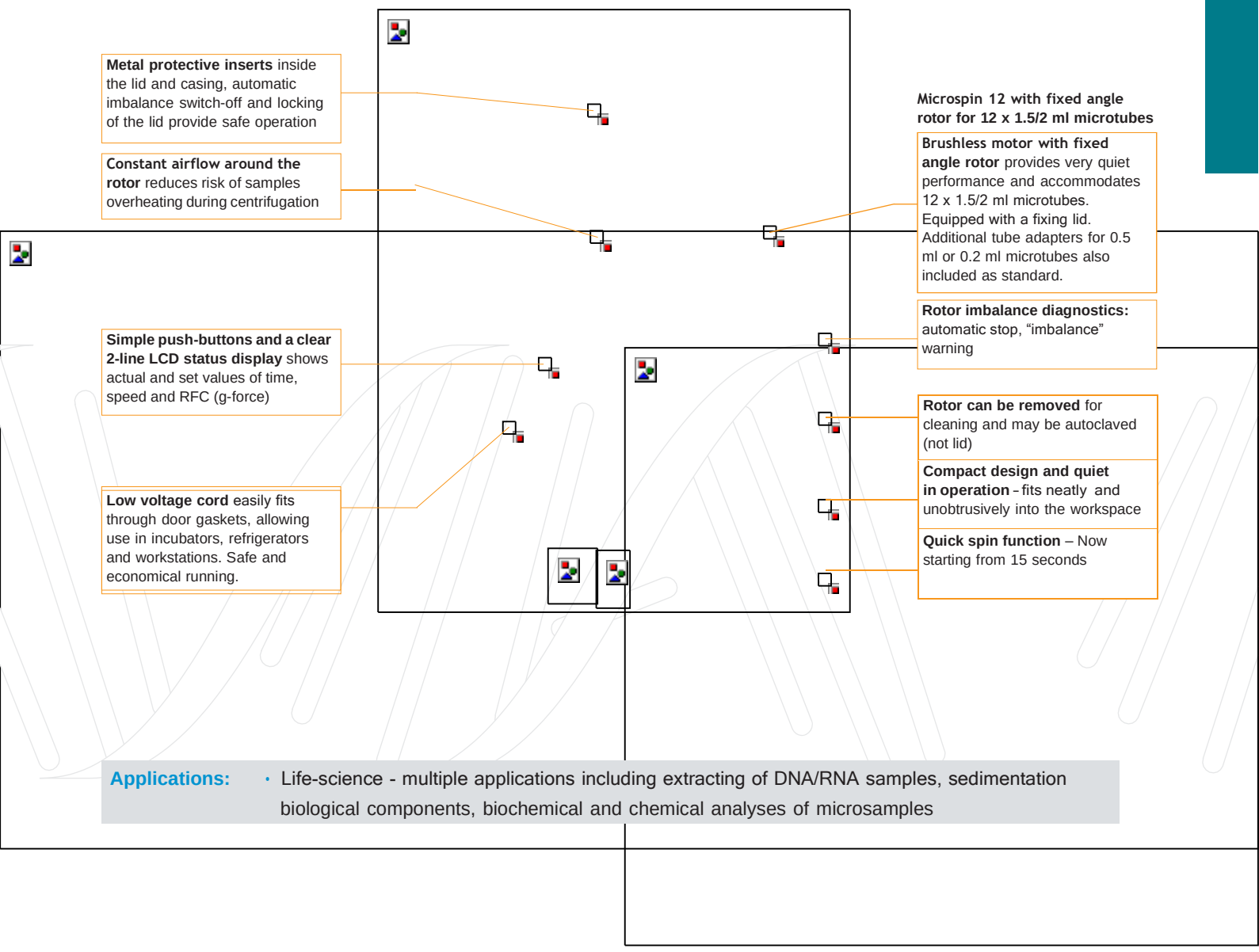
Stirrers – models and specifications

	CVP-2
	All in one PCR centrifuge/vortex
	 h: 190 mm d: 350 mm w: 285 mm weight: 6.15 kg
Centrifuge mixing speed control range	300 to 1500 rpm
Vortex mixing speed control range	300 to 1200 rpm
Speed control increment	100 rpm
G-force / RCF	245
Centrifuge timer with sound alarm	0 to 30 mins
Vortex timer with sound alarm	0 to 60 seconds
Centrifuge / vortex cycles	1 to 999
Input current / power consumption	100-240 V 50/60 Hz; Output DC 24 V, 24 V, 1 A / 24 W
Capacity	2 un-, semi or fully skirted microplates

Microspin 12 high-speed microcentrifuge

Compact high-speed benchtop microcentrifuge with a built-in rotor for 12 x 1.5/2ml microtubes. Ideal for biomedical laboratories.

- **Centrifugation speed: 100-14,500 rpm, RCF 12,400xg**
- **Fixed angular aluminium rotor accommodates 12 x 1.5/2 ml microtubes, supplied with adapters for 0.2ml and 0.5ml tubes**
- **Timed operation (1 to 30 minutes), with automatic switch-off**
- **Suitable to use in cold rooms, operating temperature ambient +4°C to +25°C**
- **Very small footprint**



Metal protective inserts inside the lid and casing, automatic imbalance switch-off and locking of the lid provide safe operation

Constant airflow around the rotor reduces risk of samples overheating during centrifugation

Simple push-buttons and a clear 2-line LCD status display shows actual and set values of time, speed and RFC (g-force)

Low voltage cord easily fits through door gaskets, allowing use in incubators, refrigerators and workstations. Safe and economical running.

Microspin 12 with fixed angle rotor for 12 x 1.5/2 ml microtubes

Brushless motor with fixed angle rotor provides very quiet performance and accommodates 12 x 1.5/2 ml microtubes. Equipped with a fixing lid. Additional tube adapters for 0.5 ml or 0.2 ml microtubes also included as standard.

Rotor imbalance diagnostics: automatic stop, "imbalance" warning

Rotor can be removed for cleaning and may be autoclaved (not lid)

Compact design and quiet in operation – fits neatly and unobtrusively into the workspace

Quick spin function – Now starting from 15 seconds

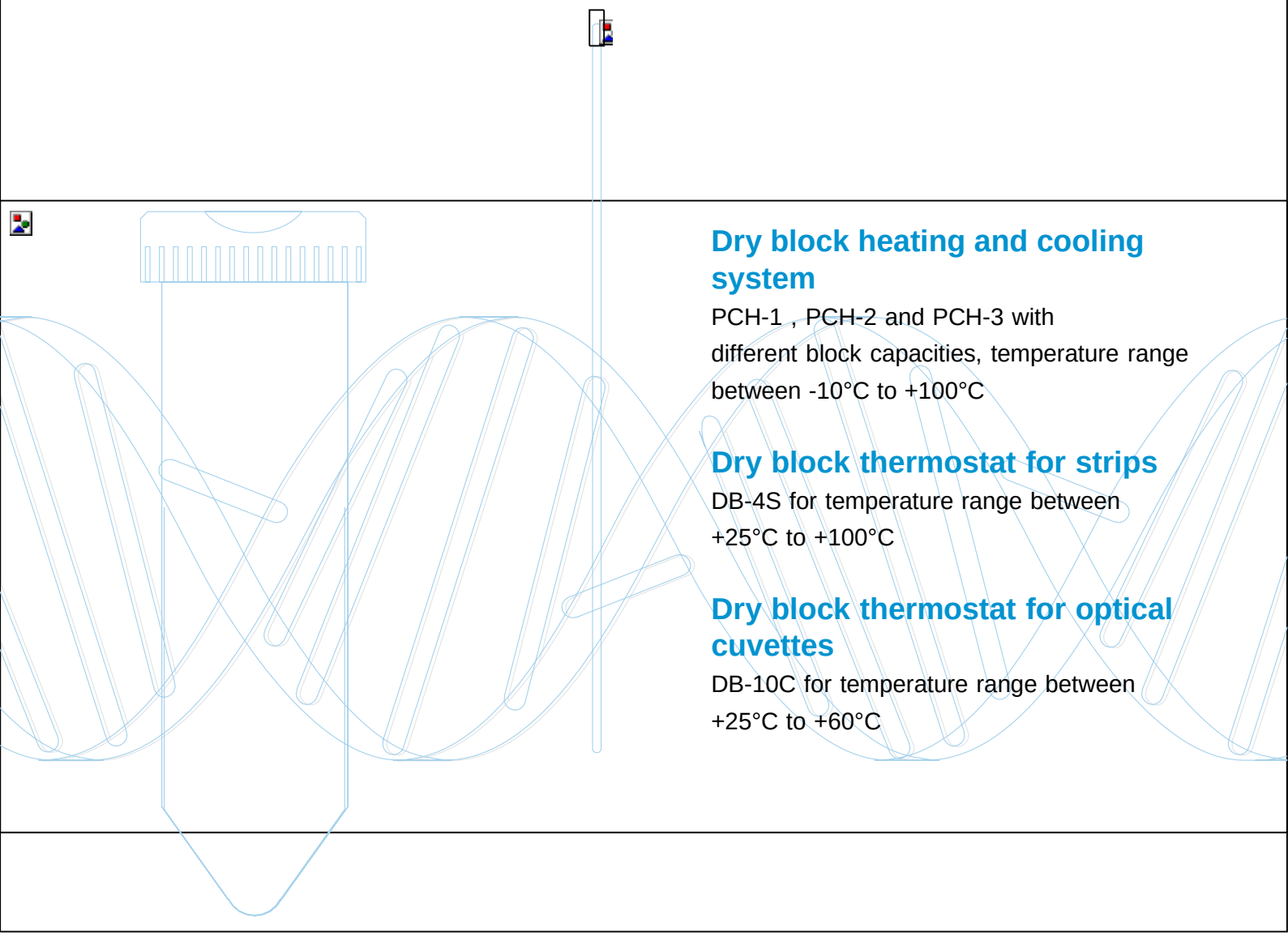
Applications:

- Life-science - multiple applications including extracting of DNA/RNA samples, sedimentation biological components, biochemical and chemical analyses of microsamples

Microspin 12 specifications

● = standard	Mini centrifuge Microspin 12 high speed
	 h: 125 mm d: 240 mm w: 200 mm weight: 3.5kg
Max RCF (bottom of tube) g-force g	12,400
Speed (centrifuge tubes) rpm	100-14,500
Operation time	15 seconds - 30 minutes
Run-up time	max 20 sec
Run-down time	max 10 sec
Capacity 12 x 1.5/2ml microtubes Adaptors for 12 x 0.5ml microtubes Adaptors for 12 x 0.2ml microtubes	●
Display	2 line x 16 character LCD
Input current / voltage A / W	2.5 A / 60 W
V	100-240
Maximum noise dBA	61.2

13 Dry blocks for heating and cooling



Dry block heating and cooling system

PCH-1 , PCH-2 and PCH-3 with different block capacities, temperature range between -10°C to +100°C

Dry block thermostat for strips

DB-4S for temperature range between +25°C to +100°C

Dry block thermostat for optical cuvettes

DB-10C for temperature range between +25°C to +60°C

Dry block heating/cooling systems

PCH-1, PCH-2 and PCH-3

Compact, flexible, easy to use systems for rapid heating and cooling of microtubes; very effective tools for DNA/RNA sample preparation techniques.

- **Cooling/heating setting range from -10°C to 100°C, with very rapid cool down and heat-up times**
- **Stability ±0.1°C**
- **Choice of three models: capacity for up to 32 microtubes in a combination of two sizes (PCH-1) or up to 20 microtubes of one size (PCH-2 and PCH-3)**
- **Convenient integral reaction timer with audible alarm**

2 year warranty

Model PCH-1 shown

Ingenious block construction, combined with powerful Peltier cooler, produces very rapid heating and cooling

Dry temperature control system maintains clean and aerosol-free environment

2-line LCD display clearly indicates both set and actual values for temperature and time

Simple push button combinations for easy set-up

PCH-1 Block holds a combination of two microtube sizes simultaneously – up to a total of 32 tubes: 12 x 1.5 ml plus 20 x 0.5 ml
PCH-2 up to a total of 20 x 1.5 ml mictrotubes
PCH-3 up to a total of 20 x 2 ml microtubes

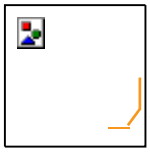
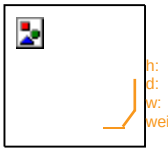
Rapid DNA denaturation at 95°C quickly achieved

DNA denaturation techniques further supported with an audible alarm for denaturation 'time-up'; samples can then be quickly cooled

Applications:

- Life-science - storing restriction enzymes, nick translations, ligation reactions, restriction digests, protein solubilisation for PAGE, warm incubation of microcentrifuge tubes for hybridisation, enzyme reactions and deactivations
- Clinical - cooling blood samples prior to coagulation testing

PCH dry block heating/cooling systems - models and specifications

		PCH-1	PCH-2	PCH-3
		 h: 165 mm d: 260 mm w: 240 mm weight: 3.6 kg	 h: 165 mm d: 260 mm w: 240 mm weight: 3.6 kg	 h: 165 mm d: 260 mm w: 240 mm weight: 3.6 kg
Block dimensions	mm	100 x 110		
Temperature setting range	°C	-10 to 100		
Temperature control range	°C	ambient -30°C to 100°C		
Stability	°C	±0.1		
Setting resolution	°C	0.1		
Temperature display		2 line x 16 character LCD		
Heat up time	25°C to 37°C °C/min	3		
	25°C to 100°C °C/min	16		
Cool down time	100°C to -10°C °C/min	28		
	25°C to - 10°C °C/min	21		
Capacity	microtubes	12 x 1.5 ml plus 20 x 0.5 ml	20 x 1.5 ml	20 x 2.0 ml
Timer		1 min to 96 hrs / non-stop		
Input voltage	V dc	12		
Input current	A	4.4		
Power supply	V	100-240		

Dry block thermostat for strips

DB-4S

Designed for maintaining constant temperature of samples in tube strips. Aluminium dry block offers excellent stability and uniformity with a LCD screen displaying actual and set time and temperature. Ideal for PCR analysis.

- **Heating setting range from +25°C to 100°C**
- **Temperature control range ambient +5°C to 100°C**
- **Stability ±0.03°C and uniformity ±0.12°C**
- **Block capacity: 0.2 ml x 32 microtubes or 4 x 0.2 ml PCR strips**

2 year warranty

DB-4S dry block thermostat

Dry block holds 32 x 0.2 ml microtubes or 4 x 0.2 ml strips

Dry temperature control system maintains clean and aerosol-free environment

Ultra compact, saving bench space

2-line LCD display clearly indicates both set and actual values for temperature and time

Timer with an audible alarm alerts when attention is required

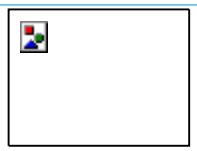
Simple push button combinations for easy set-up

Low voltage cord easily fits through door gaskets, allowing use in incubators, refrigerators and workstations. Safe and economical running.

Applications:

- PCR analysis
- Any application requiring heating in 0.2ml tubes

Dry block thermostat for strips - specifications

			DB-4S
			 h: 70 mm d: 120 mm w: 140 mm weight: 0.7 kg
Temperature setting range		°C	+25 to 100
Temperature control range		°C	+5 above ambient to 100
Stability at 37°C		°C	±0.1
Uniformity at 37°C		°C	±0.1
Setting resolution		°C	0.1
Temperature display			2-line 16 character LCD
Heat up time	25°C to 37°C	min	4
	25°C to 60°C	min	10
	25°C to 100°C	min	40
Capacity		microtubes	32 x 0.2 ml
		PCR strips	4 strips of 8 x 0.2 ml
Timer			1 - 96 hrs / non-stop
Input voltage		V dc	12
Input current		A	0.85
Power supply		V	100-240

Dry block thermostat for cuvettes

DB-10C

Designed for maintaining constant temperature of samples in cuvettes before optical density measurements. Aluminium dry block offers excellent stability and uniformity, LCD screen for actual and set time and temperatures.

- **Heating setting range from +25°C to 60°C**
- **Temperature control range ambient +5°C to 60°C**
- **Stability ±0.1°C and uniformity 0.3°C**
- **Block capacity: 10 cuvettes (10mm optical pathway)**
- **Temperature calibration function**

2 year warranty

DB-10C dry block thermostat

Dry temperature control system maintains clean and aerosol-free environment

2-line LCD display clearly indicates both set and actual values for temperature and time

Simple push button combinations for easy set-up

Low voltage cord easily fits through door gaskets, allowing use in incubators, refrigerators and workstations. Safe and economical running.

Dry block holds 10 cuvettes (10 mm optical pathway)

Ultra compact saving bench space

Timer with an audible alarm alerts when attention is required

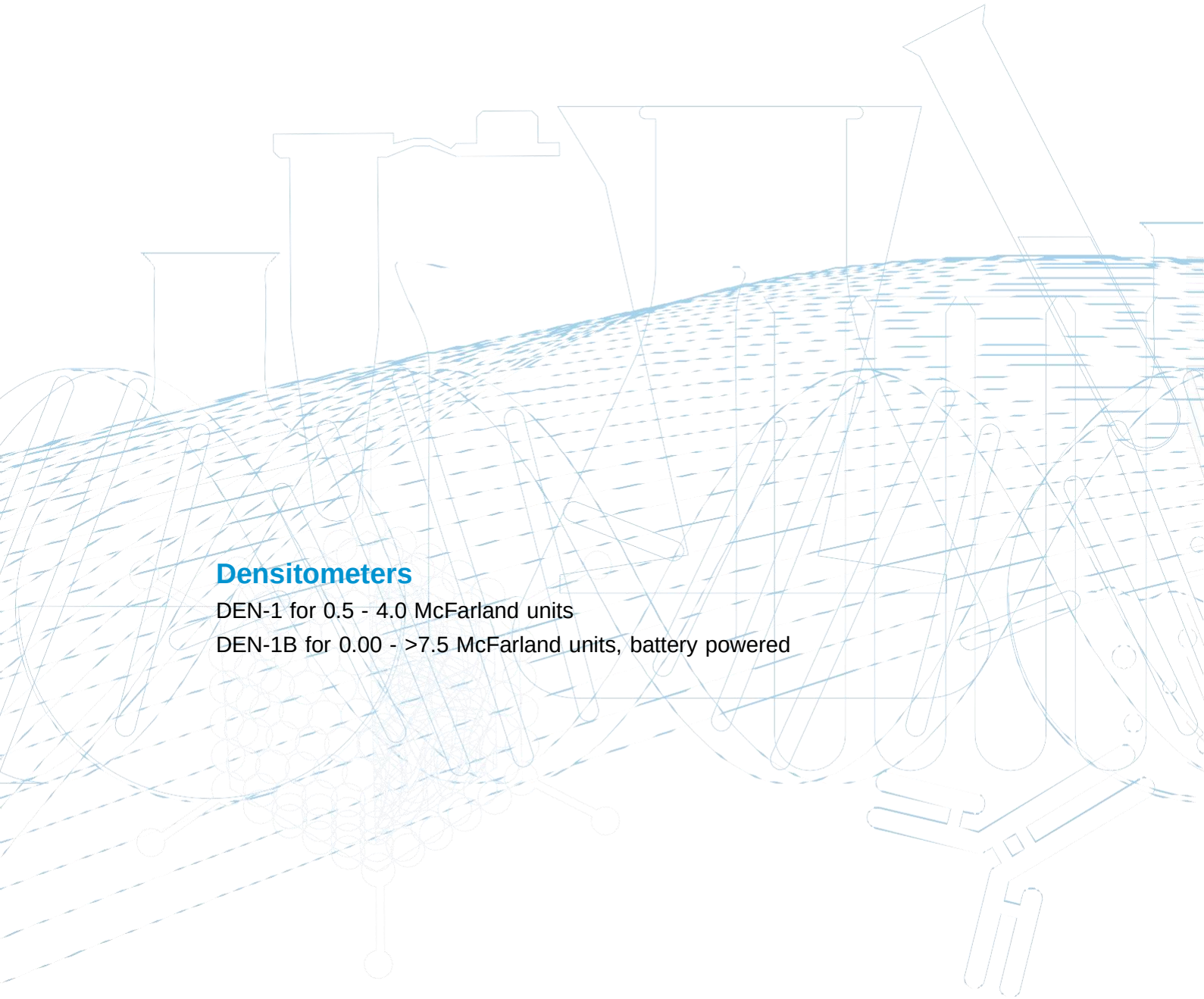
Applications:

- Life-science - Preparation for photometric analysis and diagnostics methods (enzyme reaction intensity and metabolite concentration)

Dry block thermostat for cuvettes

			DB-10C
			 h: 70 mm d: 120 mm w: 140 mm weight: 0.8 kg
Temperature setting range		°C	+25 to 60
Temperature control range		°C	ambient +5 to 42
Stability @ 37°C		°C	±0.1
Uniformity @ 37°C		°C	±0.3
Setting resolution		°C	0.1
Temperature display			2-line 16 character LCD
Heat up time	room temperature to 42°C	min	15
Capacity		cuvettes	10
Timer			1 - 96 hrs/non stop
Input voltage		V dc	12
Input current		A	1
Power supply		V	100-240

14 Densitometers



Densitometers

DEN-1 for 0.5 - 4.0 McFarland units

DEN-1B for 0.00 - >7.5 McFarland units, battery powered

Densitometers

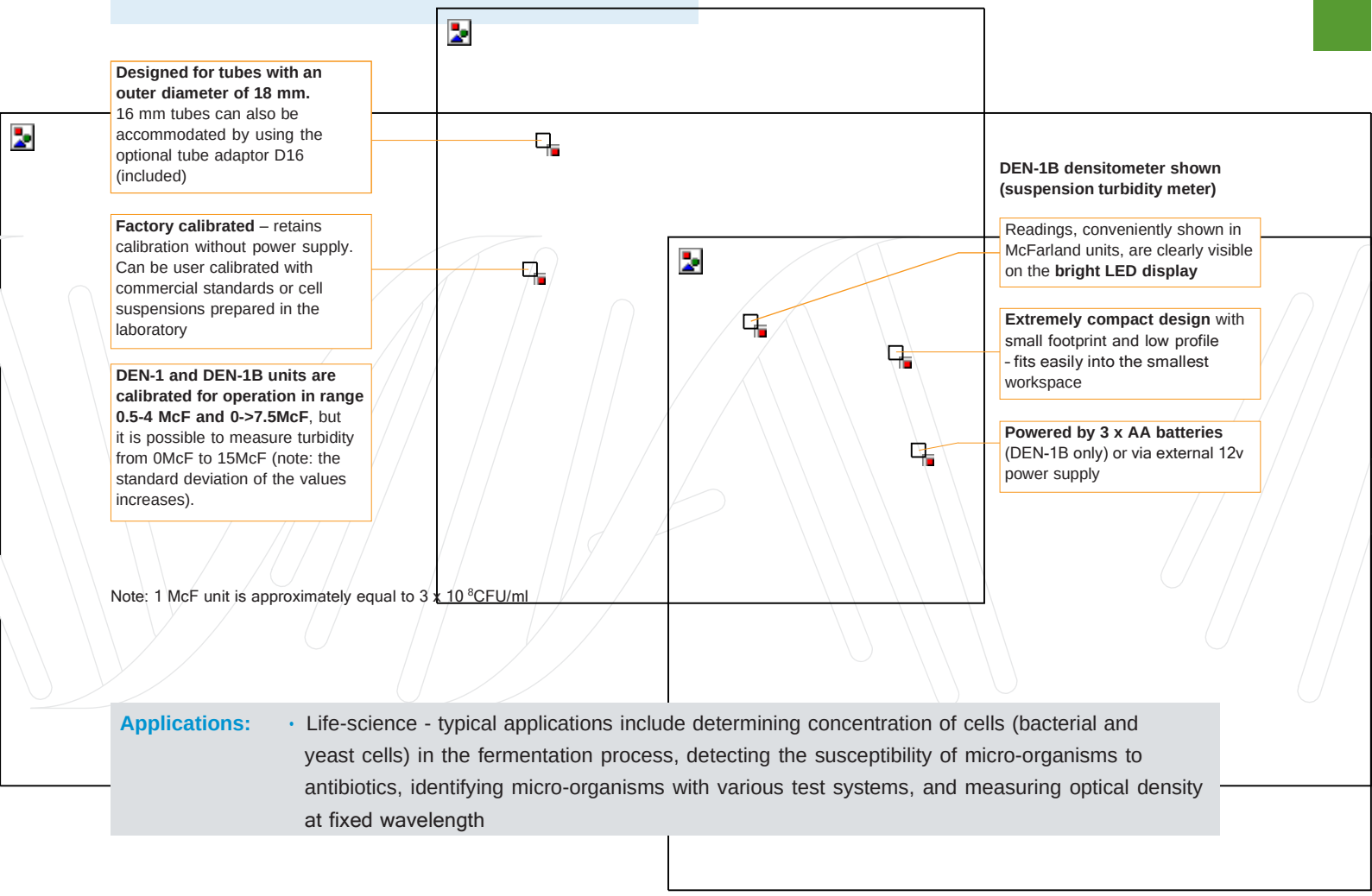
DEN-1 and DEN-1B

Compact and efficient benchtop densitometers for measuring turbidity of cell suspensions in a variety of life-science applications.

The densitometers are designed and factory calibrated to measure turbidity in the range of 0.5 to 4.0 McFarland units (DEN-1) 0.00 to >7.5 McFarland units (DEN-1B) with a small standard deviation. If required, they can deliver a wider measurement range (up to 15.00 McFarland units), but with a greater standard deviation.

- **Measurement range: 0.5 to 4.0 McFarland units (DEN-1), 0.00 to >7.5 McFarland units (DEN-1B)**
- **Measurement time: 1 second**
- **Precision: ± 3%**
- **Standard deviation at 3.00 McF units: ± 0.1 McF**
- **User calibration option**

2 year warranty



Designed for tubes with an outer diameter of 18 mm. 16 mm tubes can also be accommodated by using the optional tube adaptor D16 (included)

Factory calibrated – retains calibration without power supply. Can be user calibrated with commercial standards or cell suspensions prepared in the laboratory

DEN-1 and DEN-1B units are calibrated for operation in range 0.5-4 McF and 0->7.5McF, but it is possible to measure turbidity from 0McF to 15McF (note: the standard deviation of the values increases).

DEN-1B densitometer shown (suspension turbidity meter)

Readings, conveniently shown in McFarland units, are clearly visible on the **bright LED display**

Extremely compact design with small footprint and low profile - fits easily into the smallest workspace

Powered by 3 x AA batteries (DEN-1B only) or via external 12v power supply

Note: 1 McF unit is approximately equal to 3 x 10^8 CFU/ml

Applications:

- Life-science - typical applications include determining concentration of cells (bacterial and yeast cells) in the fermentation process, detecting the susceptibility of micro-organisms to antibiotics, identifying micro-organisms with various test systems, and measuring optical density at fixed wavelength

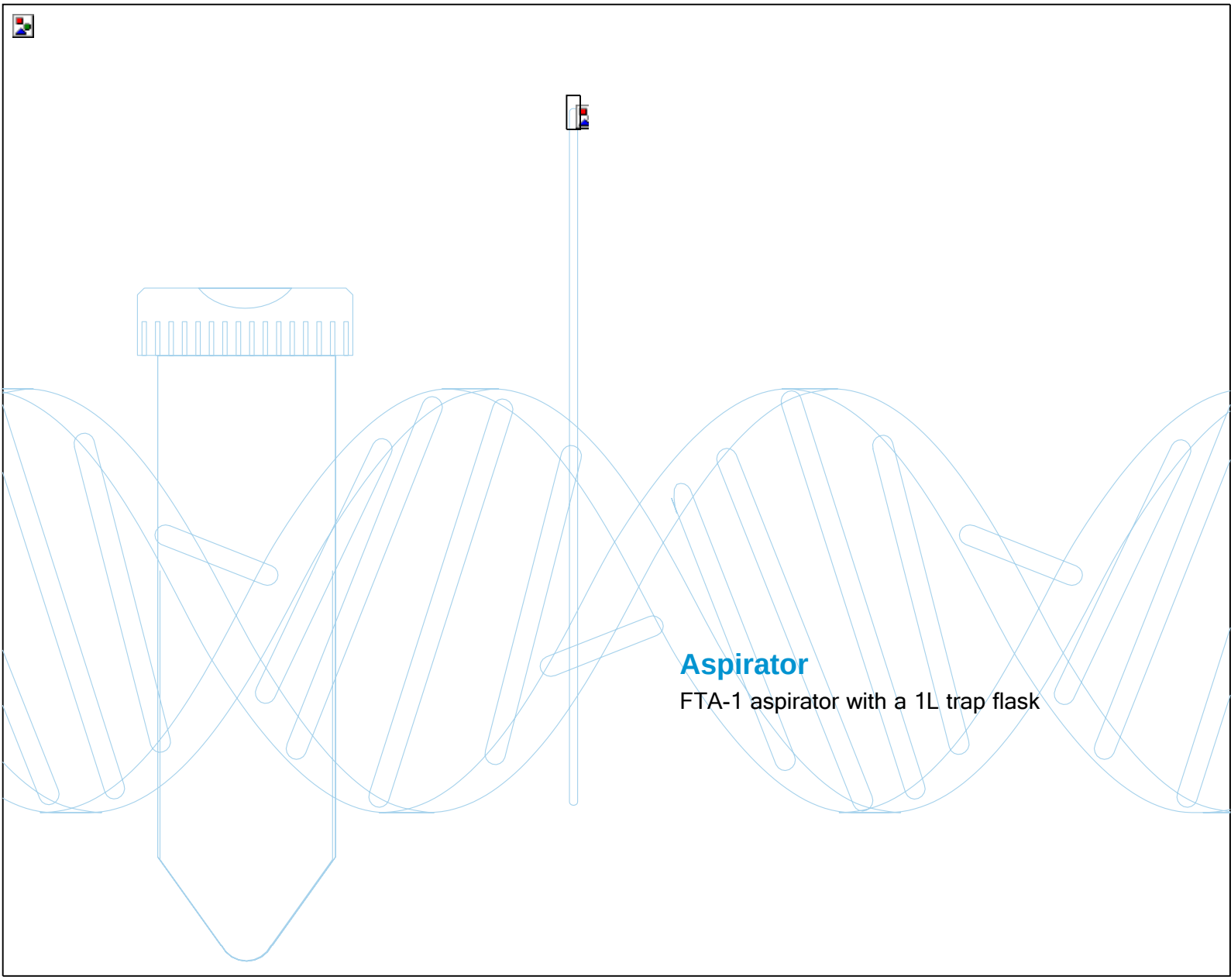
Densitometers - specification

			Densitometers	
			DEN-1	DEN-1B
			 h: 75 mm d: 115 mm w: 165 mm weight: 0.7 kg	 h: 75 mm d: 115 mm w: 165 mm weight: 0.7 kg
Light source			LED	
Wavelength		lnm	565 ± 15	
RangeMcFarland units			0.3 to 15.0	0.00 to 15.00
Precision			±3%	
Measurement time		sec	1	
Tube diameter,	external diameter	mm	18	
	with D16 adaptor	mm	16	
Sample volume		ml	>2	
Display / display resoluton			LED / 0.1 McF	LCD / 0.01 McF
External power supply			12V	
Independant power supply			-	3 x AA batteries
Ambient temperature range		°C	+ 4 to 40	
Power supply		V	100-240	

Accessories

DEN MCF STDS set of liquid McFarland standards in 16mm ø glass tubes. 0.5 / 1.0 / 2.0 / 3.0 / 4.0 can be decanted into an alternative tube (shelf-life no longer valid). Requires D16 adaptor, supplied with DEN-1 / DEN-1B.	●
DEN MCF 18 STDS set of gel McFarland standards in 18mm ø glass tubes. 0.0 / 0.5 / 3.0 / 6.0 / >7.5.	●
D16 spare tube adaptor for tubes with 16mm outer diameter (included as standard)	●

15 Aspirator



Aspirator

FTA-1 aspirator with a 1L trap flask

Aspirator with trap flask

FTA-1

Designed for routine aspiration of the supernatent alcohol/buffer from the walls of microtubes during DNA/RNA purification and other macromolecule reprecipitation techniques. An ideal personal tool for independent operation away from an in-line lab vacuum supply.

- **All in one system with integrated pump**
- **Trap flask volume 1L**
- **Fitted with hydrophobic microbiological filter**
- **Vacuum pressure of -500mbar**
- **Small, compact and easy to use**
- **Perfect for small volume aspiration**

2 year warranty

The hydrophobic microbiological suction filter eliminates risk of contamination from the trap flask. Efficiency up to 99.9% - holds particles bigger than 0.027 micron

Polyethylene tube connects the collecting tip to the trap flask

Built-in micro-compressor creates negative pressure in trap flask for removal of liquid from microtubes

Slim power cord allows the unit to be used inside workstations and incubators. Safe and economical running

1L trap flask for collection of aspirate from microtubes or microplates

Tube holder accommodates two tubes to store tip or optional 8 channel adaptor

Uses standard 'yellow' 200 ml pipette tips

MA-8 8 channel adaptor kit - includes tube adaptor, 8 channel aspiration tip and holder, autoclavable

Applications:

- Aspiration/removal of alcohol/buffer from microtube walls during DNA/RNA purification and other macromolecule reprecipitation techniques
- For routine operations of cell washing from culture medium and resuspension in buffer

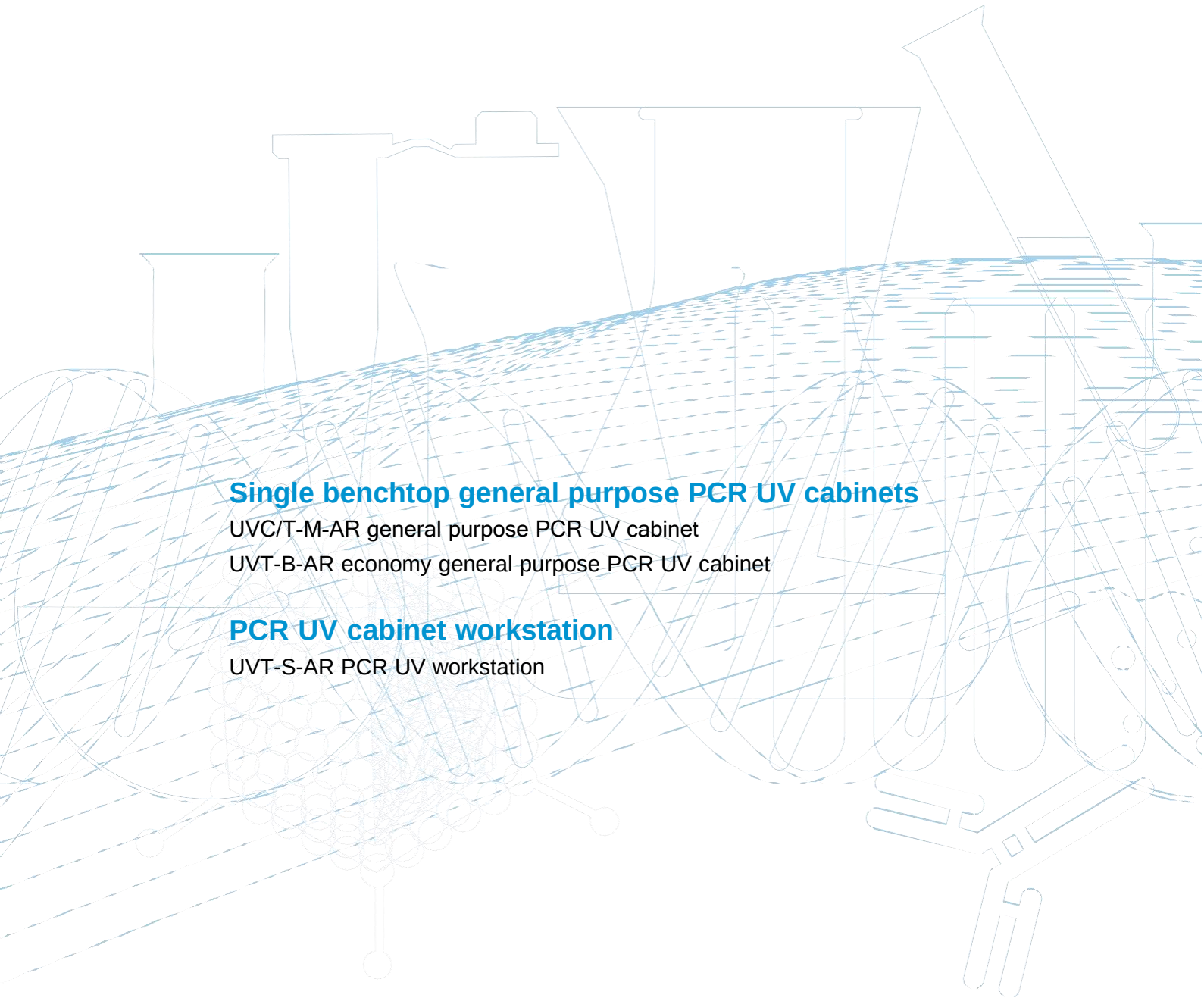
Aspirator with trap flask

		FTA-1
		 h: 340 mm d: 210 mm w: 160 mm weight: 1.7 kg
Vacuum	mbar	- 500
Trap Flask volume	L	1
Input current	V dc	12
Power supply	V	100-240
Flow rate (aqueous solution)	ml/min	72 with aspiration tip 666 without aspiration tip

Accessories

MA-8 8 channel adaptor kit , includes tube adaptor, 8 channel aspiration tip, 8 channel tip holder	•
MA-8T 8-channel aspiration tip	•
FA-1 replacement filter	•
FTA-B replacement blue cap for 1L bottle	•
FTA-T tubing set including all tubing with fittings except filter and aspiration tip	•

16 PCR UV cabinets



Single benchtop general purpose PCR UV cabinets

UVC/T-M-AR general purpose PCR UV cabinet

UVT-B-AR economy general purpose PCR UV cabinet

PCR UV cabinet workstation

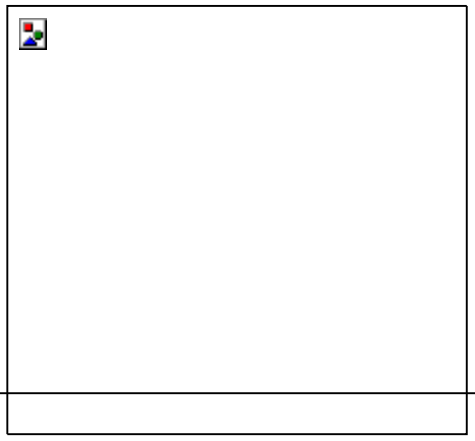
UVT-S-AR PCR UV workstation

PCR UV cabinets – DNA/RNA

Range of advanced benchtop UV cabinets providing aseptic conditions for a variety of biomedical and biochemical procedures. Innovative dual UV system: built-in UV-air recirculator provides constant decontamination of the air volume within the cabinet while working and traditional surface UV decontamination while the door is closed.

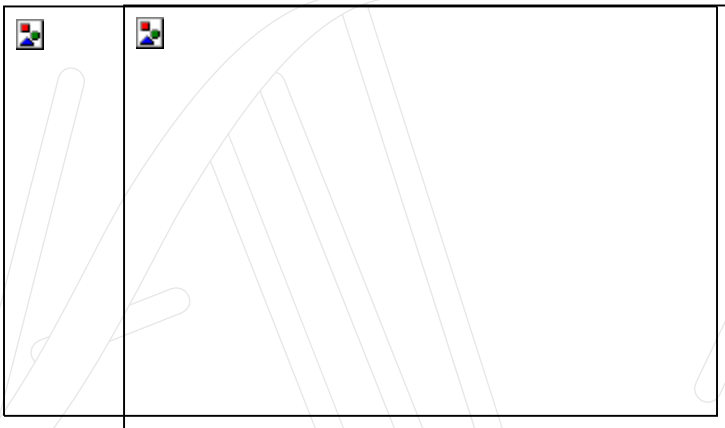
- General purpose PCR UV cabinets with UV cleaner/recirculator
- Double PCR workstation with UV cleaner/recirculator

2 year warranty



UVT-B-AR – economy UV cabinet

UVC/T-M-AR – stainless steel UV cabinet



UVT-S-AR – double PCR workstation

UVC/T-M-AR – stainless steel PCR UV cabinet

Robust general purpose stainless steel UV cabinet designed for clean operations with DNA samples, with dual UV lamp protection.

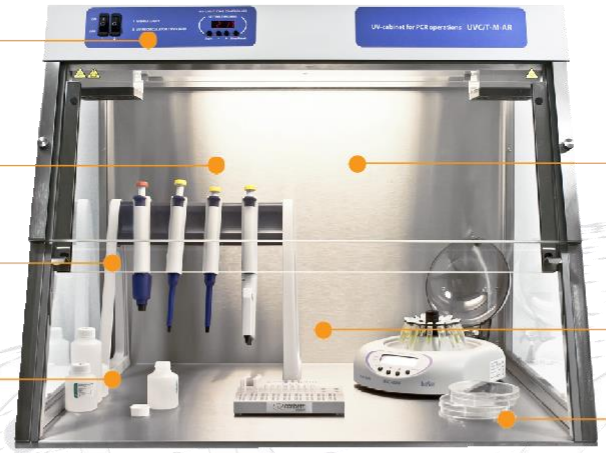
- **UV surface irradiation – via single 25 W 254 nm open UV lamp**
- **Patented high intensity UV air cleaner – 25 m³/hour cleaner-recirculator continuous air flow with 1 cm UV irradiation distance**
- **UV protection - UV-protective film on glass panels**
- **UV exposure control – 24 hour digital timer**

Convenient, easy to use digital timer for accurate control of UV exposure

White lamp provides local illumination of the workplace to optimise visual control during operations

Second UV light for irradiating the surface. Automatic switch off when door is opened

Stainless steel work surfaces, glass sides for visibility and light



Built-in UV bactericidal cleaner-recirculator increases the maximum density of UV light (in the upper hood) and generates 25 m³/h air flow exchange – prevents unwanted contamination and protects the user from direct UV light during manipulation

Front opening with three adjustable positions for ease of access

Quiet operation (33 - 37dBa) and low energy consumption (67W)

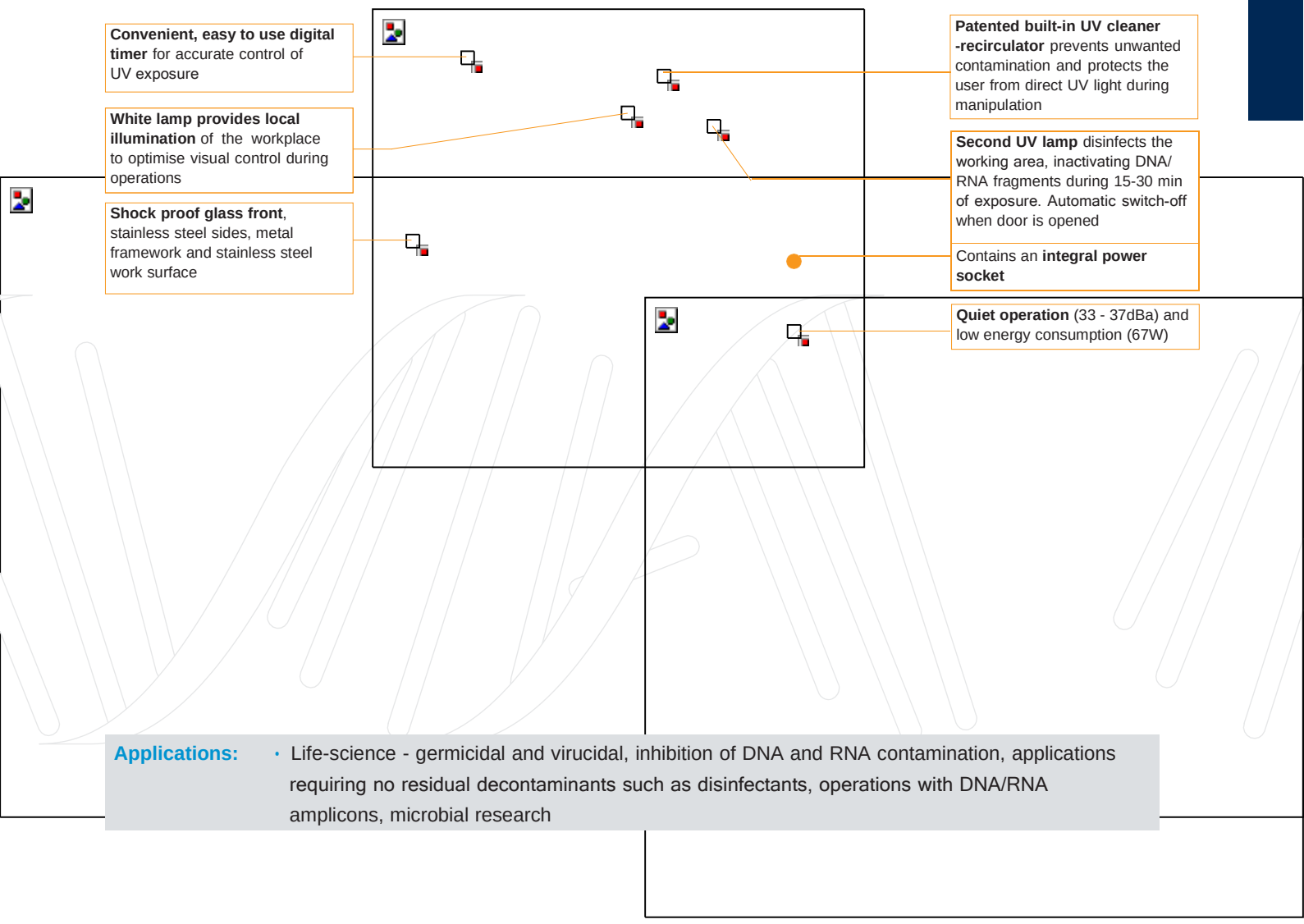
Applications:

- Life-science - germicidal and virucidal, inhibition of DNA and RNA contamination, applications requiring no residual decontaminants such as disinfectants, operations with DNA/RNA amplicons, microbial research

UV cabinet UVT-B-AR – economy PCR UV cabinet

Economy bench-top model for protection against contamination during a variety of DNA/RNA procedures, with dual UV lamp protection.

- **UV surface irradiation – via single 25 W 254 nm open UV lamp**
- **Patented high intensity UV air cleaner – 25 m^3/hour cleaner-recirculator continuous air flow with 1 cm UV irradiation distance**
- **UV exposure control – 24 hour digital timer**
- **Built-in power socket**
- **UV protection - UV protective film on glass panels**



Applications:

- Life-science - germicidal and virucidal, inhibition of DNA and RNA contamination, applications requiring no residual decontaminants such as disinfectants, operations with DNA/RNA amplicons, microbial research

UVT-S-AR double PCR workstation – stainless steel

Large capacity stainless steel UV cabinet with additional space for equipment and accessories to allow for more comfortable and convenient working in PCR applications. Dual UV lamp protection

- **Robust construction with large, 1.2 m x 0.52 m working area**
- **UV surface irradiation – dual 30 W 254 nm UV lamp**
- **Patented high intensity UV air cleaner – 25 m^3/hour cleaner-recirculator continuous air flow with 1 cm UV irradiation distance**
- **UV protection - UV-protective film on glass panels**
- **UV exposure control – 24 hour digital timer**
- **3 built-in power sockets**

Convenient, easy to use digital timer for accurate control of UV exposure

White lamp provides local illumination of the workplace to optimise visual control during operations

Front opening with three adjustable positions for ease of access

Second UV light for irradiating the surface. Automatic switch off when door is opened

Built-in UV cleaner – recirculator increases the maximum density of UV light and generates 25 m^3/h air flow exchange – prevents unwanted contamination and protects the user from direct UV light (in the upper hood) during manipulation

Ample additional space for equipment and comfortable working

Quiet operation (33 - 37dBa) and low energy consumption (150W)

Applications:

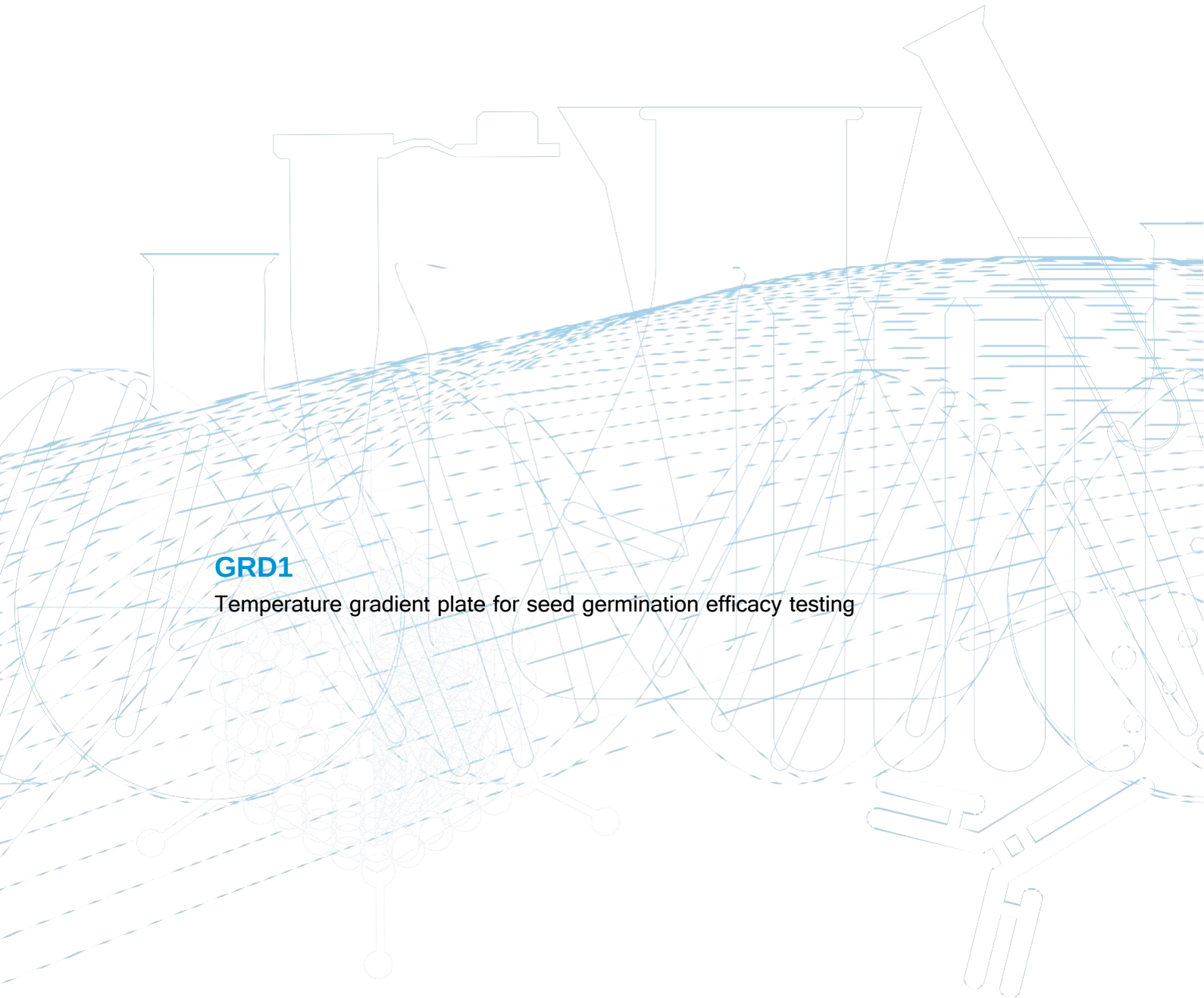
- Life-science - germicidal and virucidal, inhibition of DNA and RNA contamination, applications requiring no residual decontaminants such as disinfectants, operations with DNA/RNA amplicons, microbial research

UV cabinets – models and specifications

● = standard

	General purpose	General purpose economy	PCR workstation
	UVC/T-M-AR	UVT-B-AR	UVT-S-AR
	 31 kg h: 555 mm d: 515 mm w: 690 mm	 32 kg h: 555 mm d: 585 mm w: 690 mm	 58 kg h: 585 mm d: 585 mm w: 1245 mm
Construction	stainless steel frame and working area	stainless steel frame and working area	stainless steel frame and working area
Panels	glass with UV-protective film		
Front opening with three adjustable positions	●		
Open UV lamp, 25 W bactericidal, 254 nm, ozone free	1	1	–
Open UV lamp, 30 W bactericidal, ozone free	–	–	2
Bactericidal air recirculator, 25 m^3/h air flow exchange	●		
UV recirculator, 25W (efficiency >99% per 1 cycle)	1	1	–
UV recirculator, 30W (efficiency >99% per 1 cycle)	–	–	1
White lamp for workplace illumination 15 W	1	1	–
30 W	–	–	1
Radiation type	Ultraviolet (253.7 m), ozone free		
Optical transmission	95%		
Digital timer(non-stop) 0 to 24 hours	●		
Internal power outlets	–	1	3
Power supply	230 V		
Internal working area mm	650 x 475	650 x 475	1200 x 520
Flow rate m^3/h	7		

17 Temperature gradient plate



GRD1

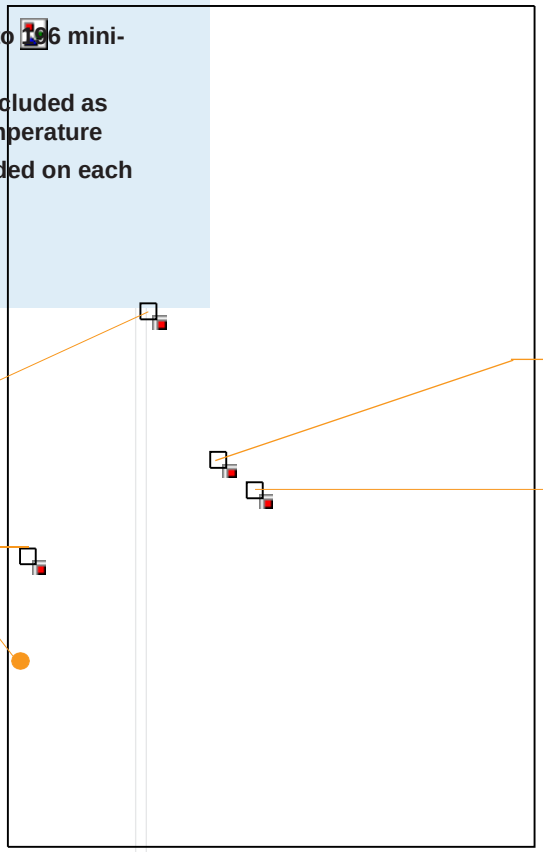
Temperature gradient plate for seed germination efficacy testing

Temperature gradient plate

Highly efficient bi-directional temperature gradient system for investigating responses to temperature shifts of seeds, small plants, insects, micro-organisms or any small component or material. The design is based on the fact that a temperature gradient results if one edge of a square aluminium plate is heated and the opposite edge is cooled.

The gradient runs in one direction for part of the 24 hour cycle and can then be automatically switched to run at a right angle to its original direction for the remainder of the cycle, to provide all possible combinations of minimum and maximum temperatures.

- **Temperature range (cold edges): +5 to 30°C**
- **Temperature range (hot edges): ambient +5 to 45°C**
- **Perspex grid divides working area into 196 mini-incubators**
- **Multi-channel Squirrel data logger (included as standard) for recording time and temperature**
- **Over temperature protection is provided on each edge by fixed temperature cut-outs**



GRD1 temperature gradient plate shown with integrated Squirrel data logger and optional hinged lid

Removable Perspex grid effectively divides the working area into 196 miniature incubators, each with a different temperature regime – allows many samples to be tested without the need for separate controlled environment chambers

Robust, fully integrated system. Fitted with wheels for easy manoeuvrability

An adjustable timer controls the length of the two phases within the 24 hour cycle which automatically switches the gradient direction as programmed

Multi-channel Squirrel data logger for recording time and temperature from five probes positioned underneath the plate – one in each corner and one in the centre – for post-cycle analyses on a PC

Developed from a design originating from Dr A. J. Murdoch and Professor E. H. Roberts of Reading University, Department of Agriculture.

The Gradient Plate can be customised to suit your application, please enquire.

Applications of the GRD1

Based on studies carried out at the University of Reading, UK

• Overcoming seed dormancy

Dormant seeds often require moist storage (stratification) to help break their dormancy. The GRD1 can help to quantify temperature effects in seeds during warm stratification as carried out by Kebreab & Murdoch, (1999a).

• Seed germination at constant temperatures

The GRD1 allows germination tests to be carried out over a very wide range of temperatures for both dormant and non-dormant seeds. Interaction with other factors such as water stress and chemicals can also be studied and modelled as was done by Kebreab & Murdoch (2000).

• Seed germination at alternating temperatures

The GRD1 will operate with the temperature gradient for part of the day in one direction and then at right angles to that direction for the rest of the day. Thus the GRD1 can provide 196 different thermal environments. The effects of constant and alternating temperatures at two thermoperiods were quantified in several species by Kebreab & Murdoch (1999b).

With many plants, particularly small-seeded species, the GRD1 provides an extremely powerful tool (Murdoch et al., 1989). Optimum temperatures are easily identified and sufficient data is available to understand and model the responses to temperature. Interactions with dormancy-relieving factors may also be investigated.

• Germination rates

The GRD1 has been invaluable in such studies as the evaluation of thermal time required for germination. Examples include Ellis & Barrett (1994) and Kebreab & Murdoch (1999C).

• Other applications

Apart from the size constraints (the GRD1 is suitable for samples up to 30mm in diameter); uses are only limited by imagination. For example, parasitism of insects by nematodes has been tested by Ratnasinghe and Hague (1998).

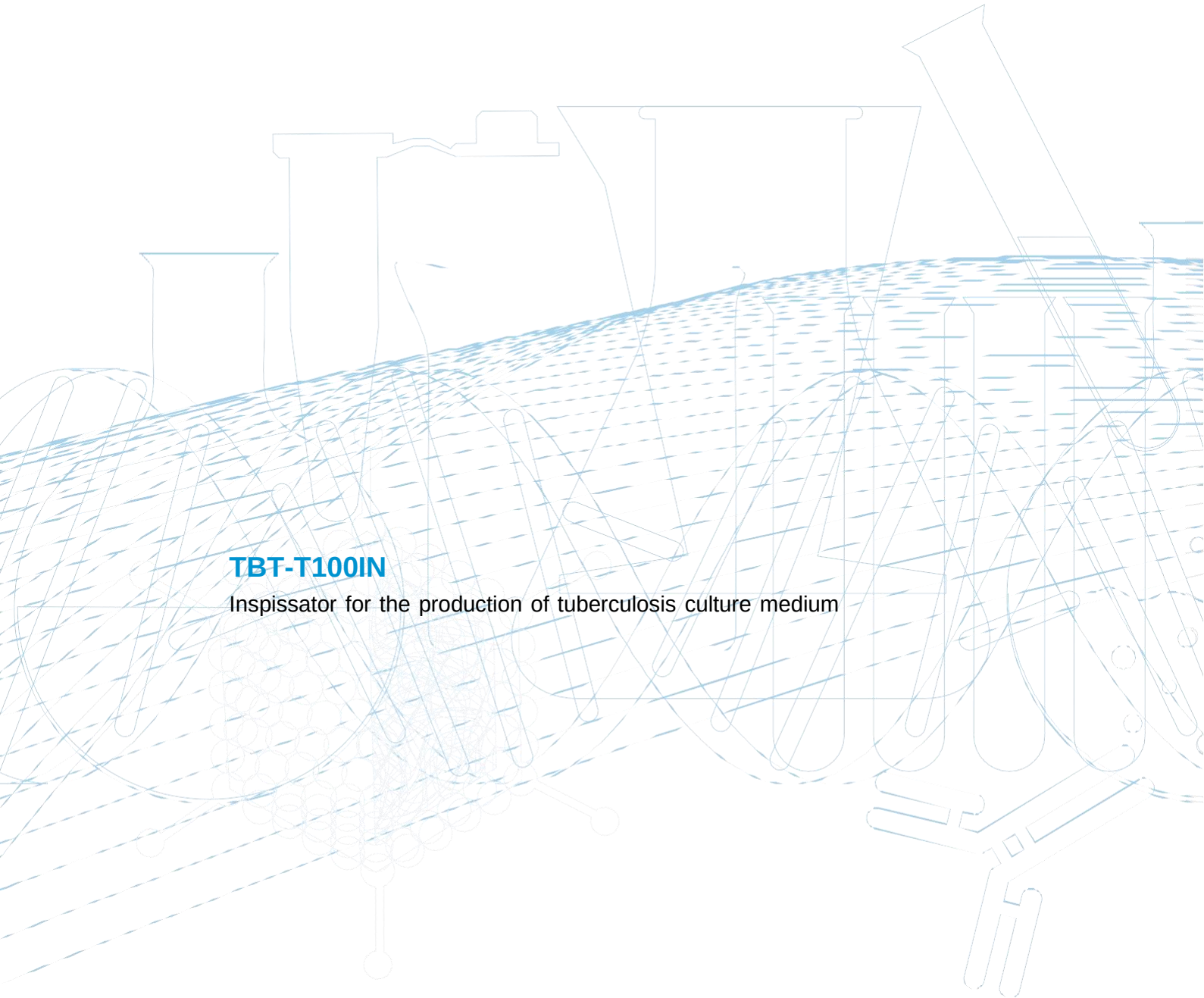
Our GRD1 and GRD1 LH are in use worldwide as critical tools in various fields, namely:

Seed Preservation	Kew Gardens and other establishments worldwide (particularly Australia and China) within the Millennium Seed Project Partnership.
Biofuel Research	Ceres, California USA
Food Crop research	Scottish Crop Research, International Rice Research Institute (IRRI), Philippines.
Plant Pest Diagnostics	California Department of Food & Agriculture (CFDA).

Products for other special applications – models and specifications

● = standard		Temperature gradient plate
		GRD1
		 229 kg h: 1040 mm d: 1020 mm w: 1020 mm
Temperature range cold edges	°C	+5 to 30
hot edges	°C	ambient +5 to 45
Stability	°C	±0.5
Setting resolution	°C	1.0
Display		digital
Display resolution °C		1.0
Time/temperature recording via Squirrel data logger		●
Working area	mm	760 x 760
Electrical power 230 V 50 Hz	W	2050
EMC (emissions)		Class A

18 Inspissator



TBT-T100IN

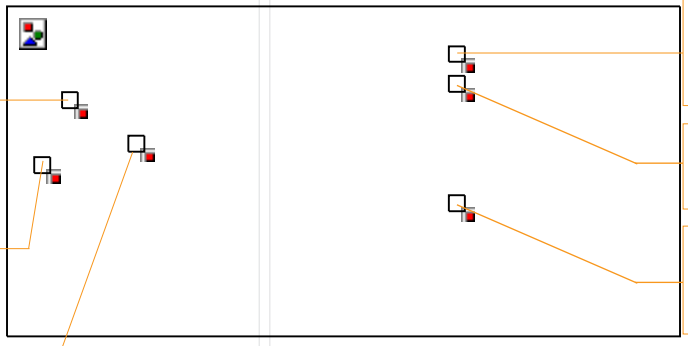
Inspissator for the production of tuberculosis culture medium

Inspissator for the production of tuberculosis culture medium

Convenient and effective system designed to produce large batches of uniform tuberculosis culture medium four to six times per day. Vessels containing culture medium are incubated on a shallow tray which is in contact with water held at a constant temperature of 85ºC within a tank, ensuring that the temperature of the vessels is constant. Inspissation takes 50 minutes at 85ºC.

- **Robust durable design, with digital temperature control**
- **Standard temperature: 85ºC; temperature range ambient +5ºC to 100ºC**
- **Capacity for up to 156 test tubes (16 mm diameter x 150 mm long) or 162 universal containers**

Grant Inspissator TBT-T100IN



Water temperature under the tray is controlled by a digital immersion thermostat for accuracy and reproducibility of set temperature. All moving parts are incorporated in the control unit which is easily removed for cleaning

Constant level device maintains required liquid level for optimal operation

Clear 4 digit display - easy to read from a distance for instant re-assurance

An insect resistant blanket and quilt are placed over the containers to provide thermal insulation and exclude draughts

A fixed over temperature cutout protects users, valuable samples and the workplace

Robust and durable construction – the tray, tank and outer case are made of polished stainless steel

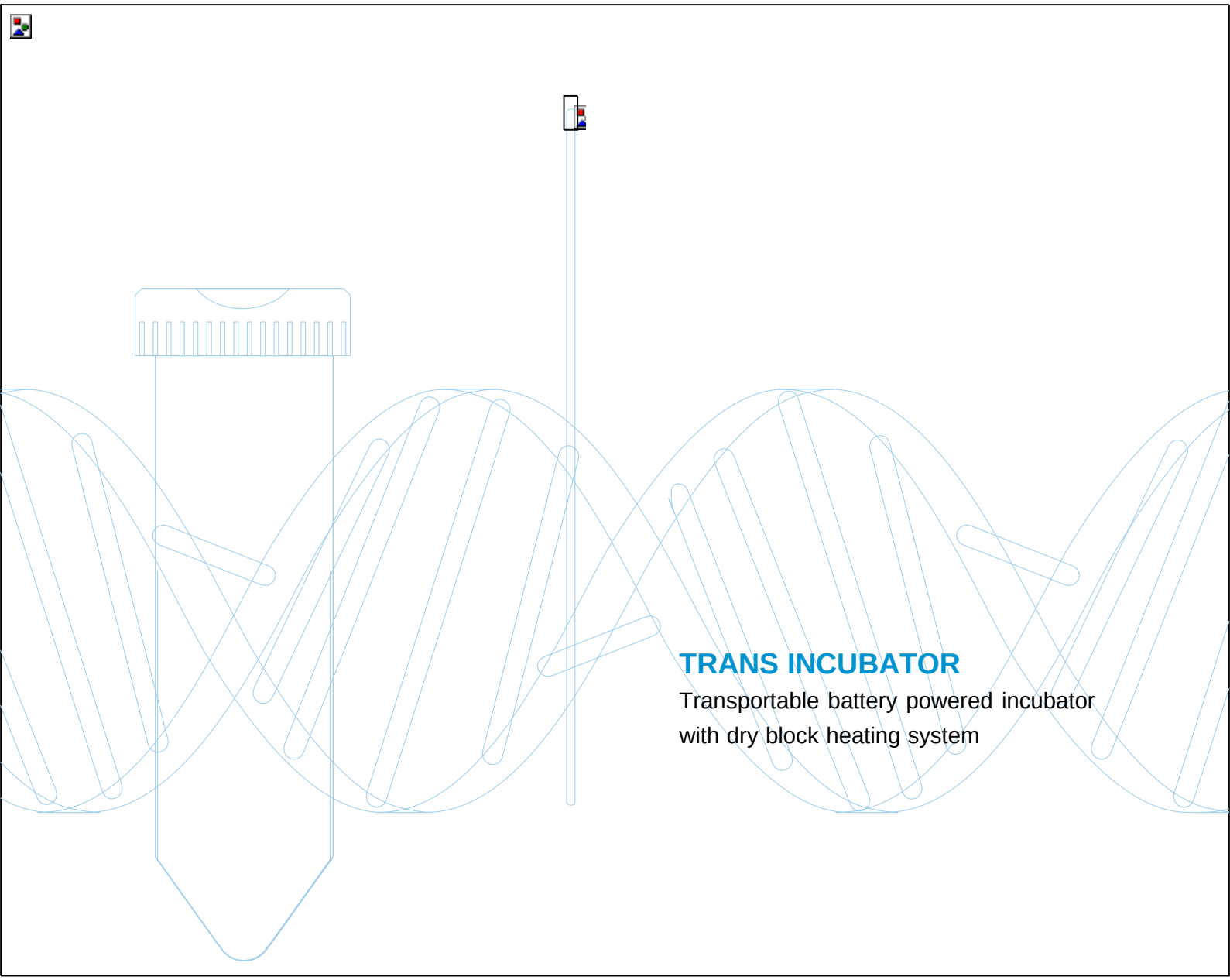
Developed in conjunction with Professor Mitchison of the Royal Postgraduate Medical School of London University and used in a number of tuberculosis laboratories which are assisted by the World Health Organisation (WHO).

According to the statistics of the WHO, TB kills more young people and adults than any other infectious disease in the world. It causes more deaths than AIDS and Malaria combined. Although the use of penicillin and antibiotics have caused the decline of this disease in some countries, hot spots of this illness still exist in eastern Europe, south east Asia and sub-Saharan Africa. Numbers that were seemingly beginning to decrease began to rise in the 1980's with the emergence of AIDS. Scientists now say that the number of people with TB around the world has reached a ten year high. The very cost effective Grant Inspissator means that it is used extensively in these areas and assists in the diagnosis of this serious disease.

Inspissator – models and specifications

			Inspissator
			TBT-T100IN
			 h: 380 mm d: 600 mm w: 1040 mm
Standard temperature		°C	85
Temperature range		°C	ambient +5 to 100
Uniformity		°C	±0.7 (tray)
Display			LED
Display resolution		°C	0.1
Heat up time	20 to 85°C	hrs	3.5
Working area/tank opening		mm	820 x 594
Tank capacity (nominal)		L	45
Safety	over temperature protection		fixed cut-out
Electrical power	120V / 230 V @ 50-60 Hz	kW	1.5/1.4
Heater power	120V / 230 V	kW	1.4/1.3
Voltage		V	120 or 230

19 Transportable incubator



TRANS INCUBATOR

Transportable battery powered incubator with dry block heating system

Transportable incubator

Convenient battery-powered transportable incubator, based on a dry block heating system, for transporting biological samples at 37°C. Ideal for applications requiring portable temperature control within the range of ambient +5°C to 45°C.

- **Temperature range ambient +5°C to 45°C**
- **Stability within the tube ±0.1°C, uniformity ±0.2°C**
- **Digital setting and display for accuracy and reproducibility of set temperature**
- **Capacity for up to 18 x 16 mm Falcon tubes – other options available**
- **Internal battery – charged from mains or vehicle 12v dc (lighter) socket (leads supplied)**
- **Robust and reliable in operation**
- **Convenient carrying case**

TRANS INCUBATOR
transportable incubator

Extremely easy to use – simply plug into the mains, set the required temperature and allow the unit to heat up. Once the set temperature is reached and the unit is disconnected, the fully charged internal battery will maintain the temperature for 4 to 5 hours and, if necessary, can be recharged by plugging into a vehicle 12v dc (lighter) socket

The bright LED display constantly displays actual temperature for at-a-glance reassurance

An over temperature cut out keeps the product and samples safe from overheating

Dry block heating system ensures a clean environment with less chance of contamination

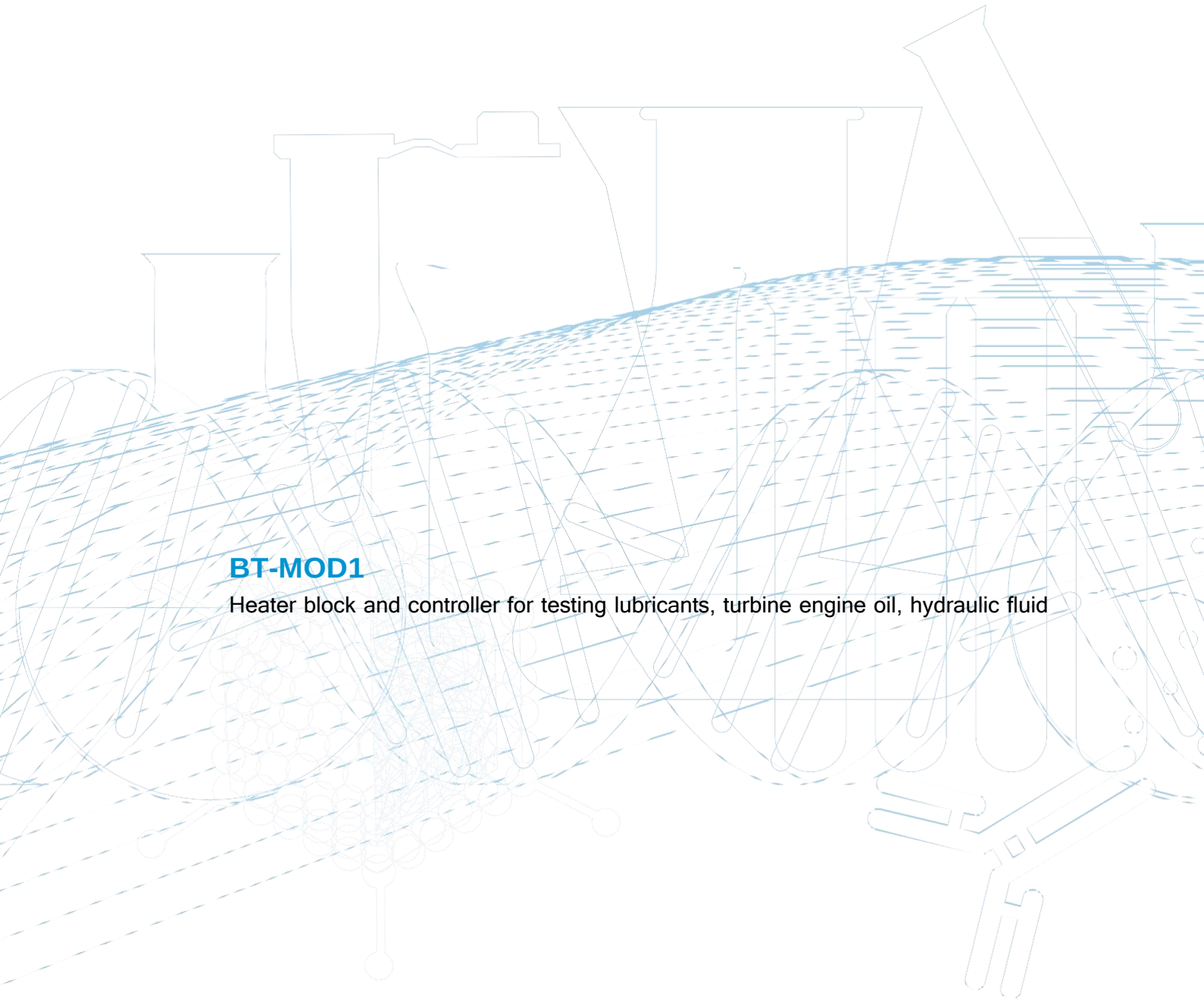
Blocks are interchangeable to provide flexibility. The standard block supplied holds up to 18 x 16 mm Falcon tubes. Alternatively you can specify your own

Small, rugged, easy-to-clean carrying case with a comfortable carrying handle and a latching lid to keep contents safe

Transportable incubator - models and specifications

			Transportable incubator
			TRANS INCUBATOR
			 h: 380 mm d: 600 mm w: 1040 mm
Temperature range		°C	ambient +5 to 45
Stability (DIN 58966)		°C	± 0.1 (tube)
Uniformity		°C	± 0.2
Display			3-digit LED
Display resolution		°C	0.1
Heater power	220/240 V	W	25
	ambient to 37°C	mins	60
Heat retention, ambient 20°C	internal battery power, 37°C	hrs	>5
Tubes	Falcon tubes		18 x ø16
Heating block	l/w/h	mm	140 x 65 x 75
Electrical power	230 V 50/60 Hz	W	48
Vehicle battery supply 12 V DC		W	24
Internal battery supply 12 V		AH	6.5
Ambient temperature		°C	+10 to 30

20 MOD heat transfer apparatus



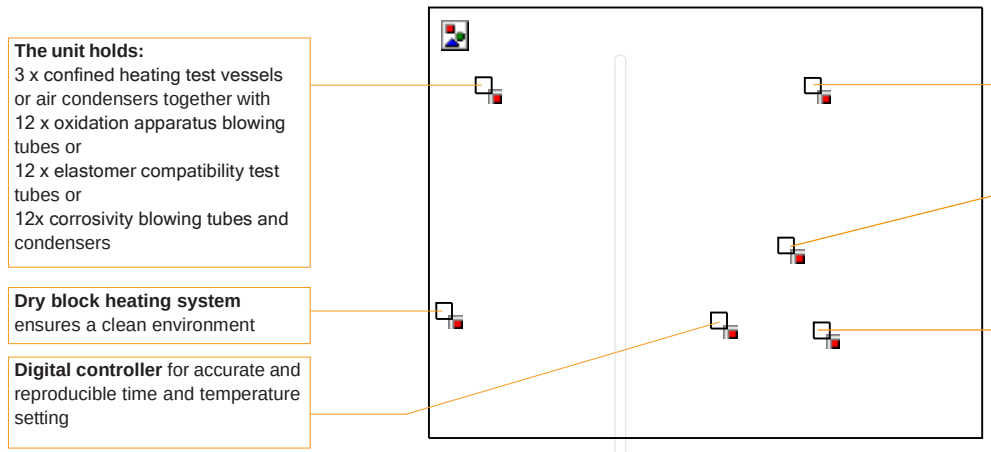
BT-MOD1

Heater block and controller for testing lubricants, turbine engine oil, hydraulic fluid

BT-MOD1 Defence Standard 05-50 (Part 61) heat transfer apparatus

Heater block and controller manufactured and specified within the Ministry of Defence, Defence Standard 05-50 (Part 61), methods for testing fuels, lubricants and associated products. Part 61: Methods for Testing Gas Turbine Engine Synthetic Lubricants

- **The 'heat transfer apparatus' specified in Methods 1, 3, 9, 14 and 22 Annex A, A.1 and A.2**
- **Temperature range ambient +10°C to 450°C**
- **Temperature display resolution 0.1°C**
- **Uniformity within the block ±0.5°C**



Clients: Defence and military, aerospace, petrochemical and contract test companies UK and worldwide.

Applications: Lubricant testing, turbine engine oil testing, hydraulic fluid testing.

Since the Second World War, no lubrication problem has offered a greater challenge to chemists than that posed by the aircraft gas turbine engine. Mineral oils provided satisfactory lubrication of piston-engine aircraft for many years, but had obvious limitations as far as jet engines. The need for new lubricants became evident. The requirements of satisfactory lubricants for aircraft gas turbine engines were discussed in 1947 by Williams, who proposed certain tentative test methods and pointed out the limitations of the mineral oils currently in use. At that time, research on potential synthetic lubricants had begun both in the U.K. and in the U.S.A. During the next four or five years, bench engine tests were carried out followed by flight trials in aircraft. In the UK specifications were laid down in the Defence Test Standards.

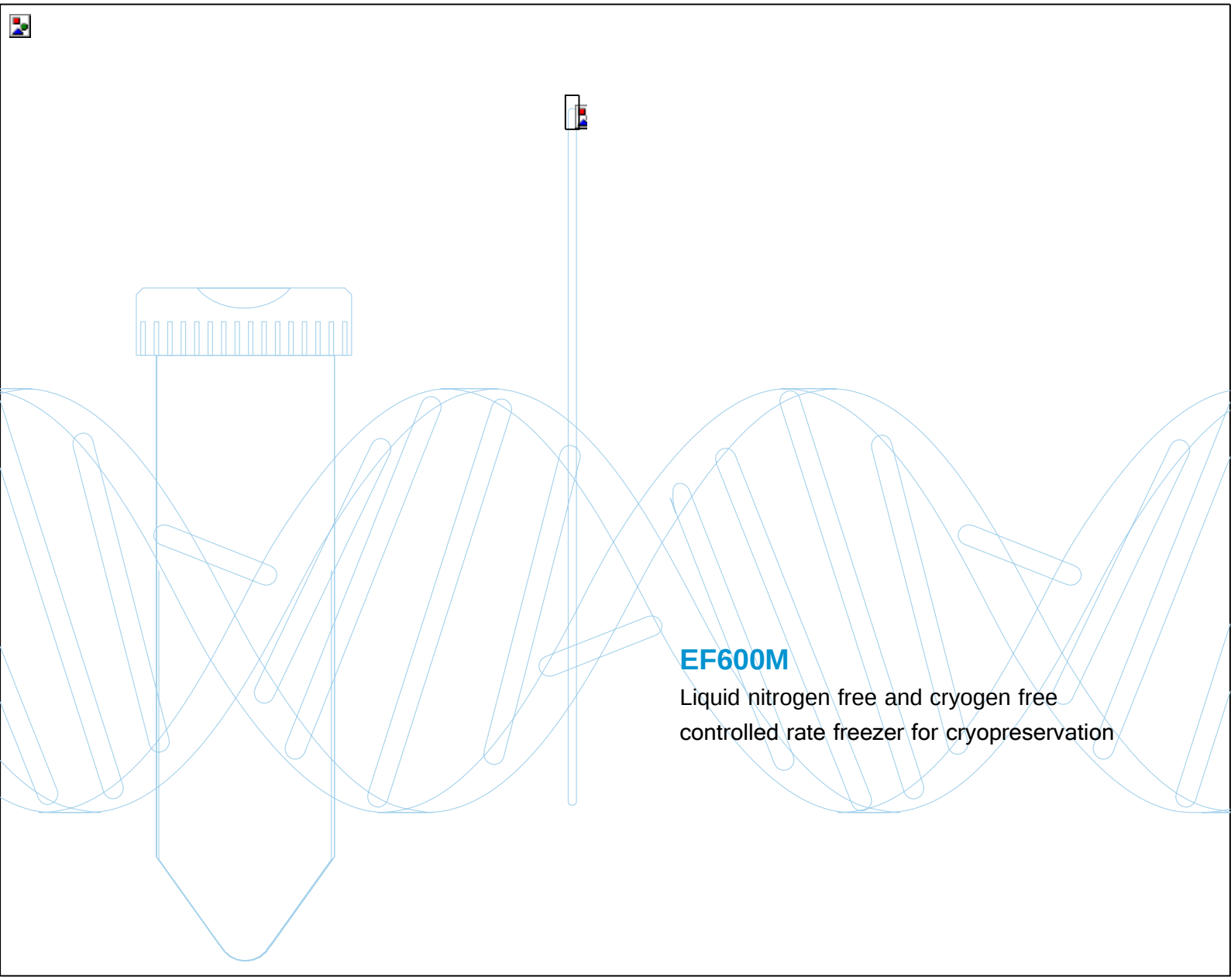
Grant was approached by a major engine manufacturer to develop an electronically controlled heat transfer block for conducting tests as per methods 1, 3, 9, 14 and 22 for evaluation of synthetic engine lubricants as stated in the ~~Defence Standard 05-50 (Part 61) Issue 2, Methods for testing Gas Turbine Engine Synthetic Lubricants.~~

Grant designed and developed the block heater which went through a series of stringent tests to ensure that the device was capable of maintaining the required sample temperature stability and uniformity.

Heat transfer apparatus – specifications

	MOD heat transfer apparatus
	BT-MOD1
	
Controller dimensions l x w x h mm	290 x 261 x 150
Heater block module dimensions l x w x h mm	460 x 310 x 275
Ambient temperature range °C	10 to 35
Temperature range °C	ambient +10 to 450
Uniformity in block °C	±0.5
Display	LED
Display resolution °C	0.1
Heater power 230 V W	2500
Over temperature protection	digital controller cut-out
Heater block	3 x ø 57 mm x 140 mm deep 12 x ø 28.5 mm x 195 deep
Safety over temperature protection	fixed cut-out
Electrical power	230 V 50/60 Hz

21 Cryopreservation



EF600M

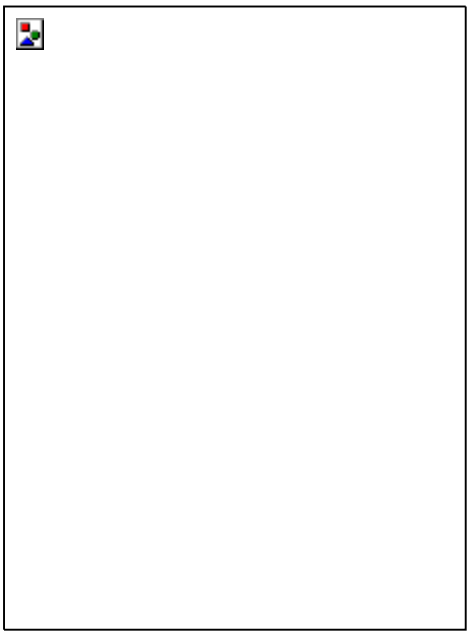
Liquid nitrogen free and cryogen free controlled rate freezer for cryopreservation

Grant Asymptote EF600M

Liquid nitrogen free and cryogen free controlled rate freezer for research into the cryopreservation of a wide range of material including: embryos, stem cells, mammalian cells, spermatozoa, antibodies, tissue sections and rodent organs. The EF600M brings accuracy, precision and reproducibility to biological cryopreservation.

Unlike conventional liquid nitrogen based controlled rate cooling equipment, the EF600M poses no contamination risk and can be used in cleanrooms and barrier facilities. The EF600M fits neatly and quietly on a bench-top and its performance in terms of cell viability after freezing is comparable or better than standard liquid nitrogen freezers. As alcohol is not used, there is also no potential fire risk. The EF600M will cool down to - 100˚C with straws.

The cooling rate of the EF600M is precisely controlled, ensuring accuracy and reproducibility throughout the freezing profile, especially for the important nucleation/seeding phase. This ensures optimal recovery of cells upon thawing. Operation is simple and can be carried out with or without a PC; data can be logged via PC software and cooling profiles are directly displayed. Different cooling profiles are available from a drop down menu and customised profiles can be written. Published trials(1) have demonstrated successful freezing and recovery of embryos, sperm and embryonic stem cells.



[1]RBM Online 13, 421-426, 2006; Cryoletters 27(3), 179-184 (2006)

Main applications

The EF600M is highly versatile and can be used for the cryopreservation research of a wide range of samples in cryovials, straws, bags, microplates and Matrix-96-well block plates in the following areas:

- Transgenic embryos research
- Stem cell research
- Clinical and research samples, e.g. lymphocytes and tissue cell lines in conventional cryovials
- Various mammalian cells including cardiomyocytes, adipose, liver and muscle
- Cord blood derived stem cells
- Adherent cells and stem cells in microplates
- Cell suspensions in numbered/barcoded arrays
- Robotic integration – the EF600M has also successfully been integrated into robotic systems

Key benefits/features

- Accurate and reproducible control of cooling rates and sample temperatures
- Easy to use and samples can be nucleated/seeded in-situ
- Linear and non-linear cooling profiles
- Low running costs: estimated at 1% of liquid nitrogen controlled rate freezing
- Temperature remains at -100˚C at the end of cycle for straw applications until freezer is switched off
- Uninterruptible Power Supply (UPS): complete cycle run if power fails (supplied as an optional accessory)
- CE marked (laboratory use)
- Servicing and calibration available
- 3 year warranty

Product range

The range includes various models each providing optimum performance for a specific and common vessel, or vessels for the combined heads including:

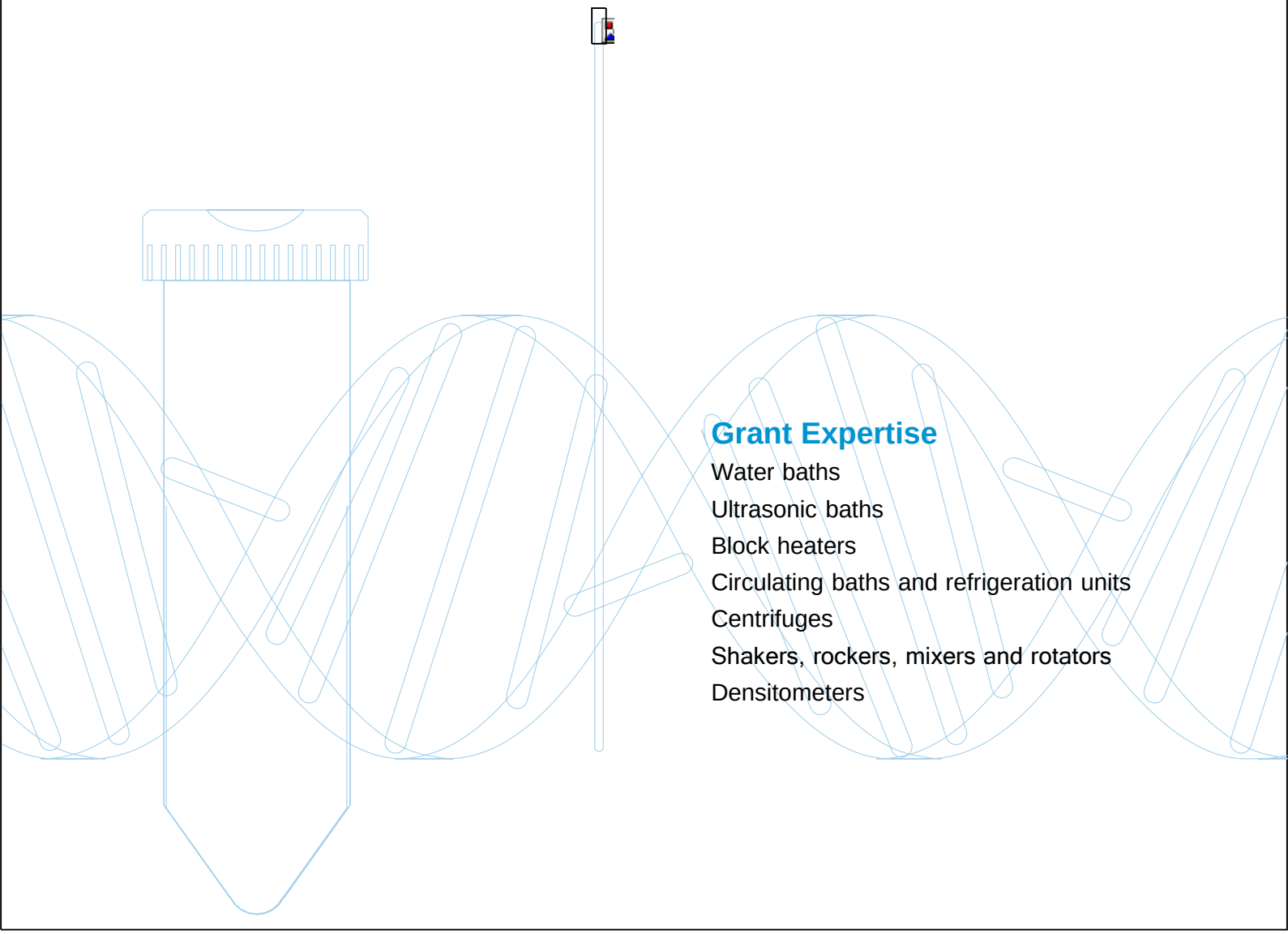
- **EF600M 100** Plate for 16 x 0.5 ml CBS high security straws
- **EF600M 101** Plate for 18 x 0.3 ml IMV straws
- **EF600M 102** Plate for 55 x 1.8 ml cryovials (0.5 ml max fill)
- **EF600M 103** Flat plate for various items/vessels
- **EF600M 104** Plate for cryocyte bag (available as a “Special” only)
- **EF600M 105** Plate for 1 x SBS microplate
- **EF600M 106** Plate for 55 x 1.8 ml cryovials (1.0ml max fill)
- **EF600M 107** Plate for 10 x 0.5 ml CBS high security straws & 12 x 1.8 ml cryovials (0.5 ml max fill)
- **EF600M 108** Plate for 12 x 0.3 ml IMV straws & 12 x 1.8 ml cryovials (0.5 ml max fill)

Accessories

- **Cryopen ice nucleating tool:**
  A small nitrous oxide cryosurgical device which uses the rapid expansion of sterile N_2O to induce ice nucleation (“seeding”) in the samples. The gas does not compromise the sterility of the operating environment.
- **Backup electrical supply:**
  Uninterruptible Power System (UPS) capable of running the freezer for a 3 hour cycle in the event of an electrical power failure

Grant are developing a number of additional accessories to compliment the EF600M. For further information please contact Grant technical support. Contact details are provided at the front of this catalogue.

22 OEM and private label projects



Grant Expertise

Water baths
Ultrasonic baths
Block heaters
Circulating baths and refrigeration units
Centrifuges
Shakers, rockers, mixers and rotators
Densitometers

OEM and private label projects

Grant Instruments has been developing and supplying controlled heating, cooling and sample preparation equipment for over 60 years. Our products are used worldwide in scientific education, research and industry. Grant is renowned for its high quality products and innovative design which is why we are the partner of choice for companies looking to embark on private label or OEM projects.

We have partnered with many large and small companies working in a wide variety of fields including life-science, petrochemical testing, defence, semi-conductor, industrial and health care. Our team of engineers, project and product managers are experts in the processes needed to deliver OEM and private label projects on time and to budget.

- **Constant temperature equipment: water baths, ultrasonic baths, block heaters, circulating baths and refrigeration units**
- **Centrifugation**
- **Shakers, rockers, mixers, rotators and densitometers**

Project examples:

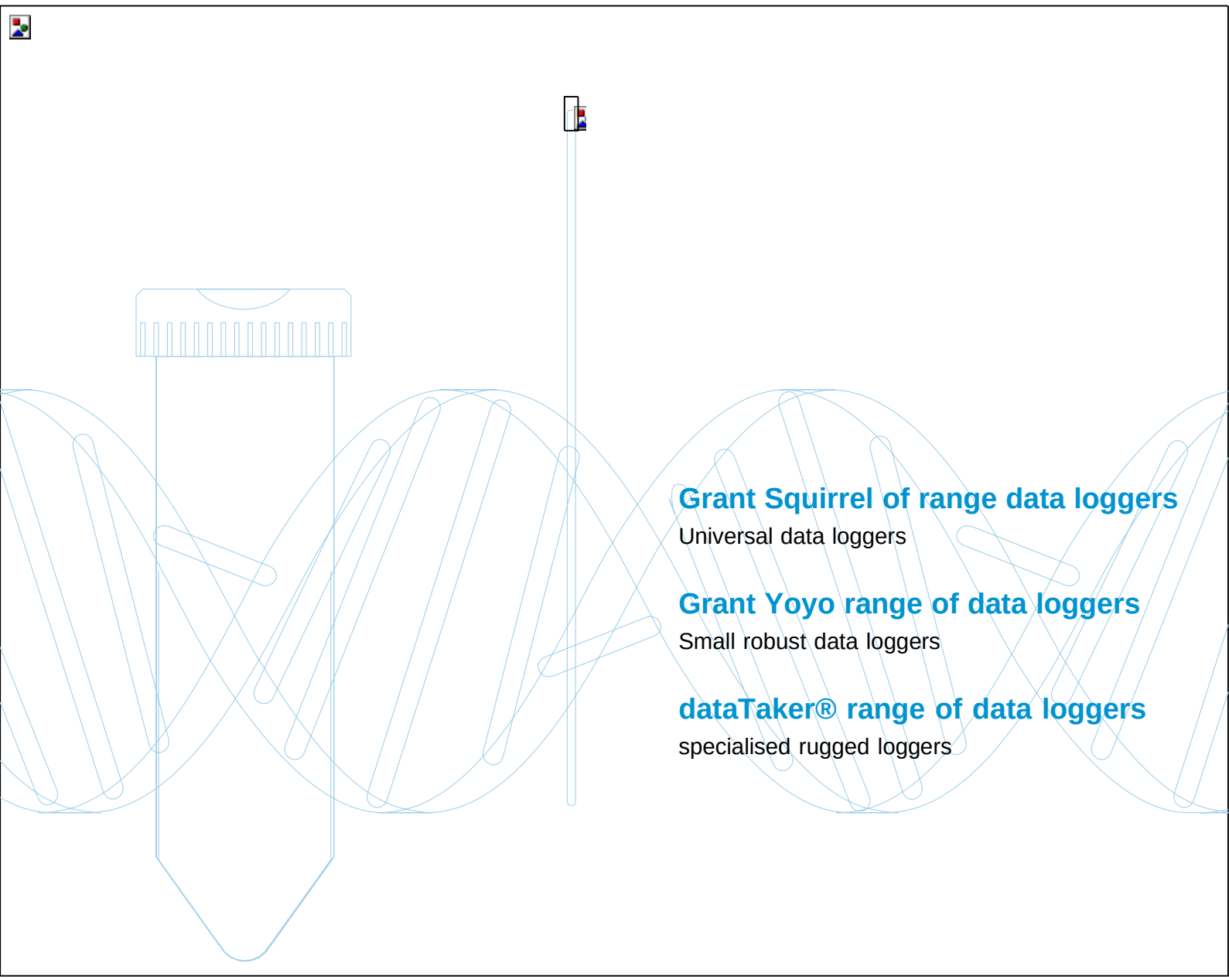
- You are a life-science company looking to bundle a consumable with a complimentary instrument for a specific application
- You are developing a larger system which requires an equipment component to deliver sample preparation or thermal control
- Your company is looking to expand its product range and is seeking a piece of sample preparation or thermal control equipment to compliment the range
- You are a distributor and wish to develop your own brand of products

Why choose Grant?

- With hundreds of products successfully developed and marketed to date we have both the capabilities and the resources to act as your perfect partner for OEM and private label projects
- We operate an ISO certified project delivery process which ensures your requirements efficiently transition into a quality finished product
- We consistently achieve excellent vendor ratings, covering on-time delivery, quality and service

Call our commercial team today to discuss your requirements or visit: www.grantinstruments.com

23 Grant data loggers



Grant Squirrel of range data loggers

Universal data loggers

Grant Yoyo range of data loggers

Small robust data loggers

dataTaker® range of data loggers

specialised rugged loggers

Grant data loggers

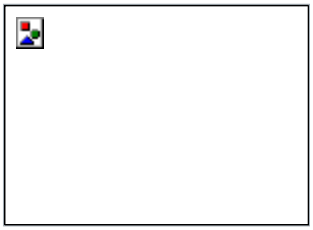
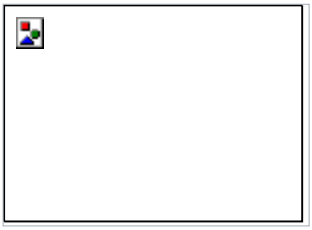
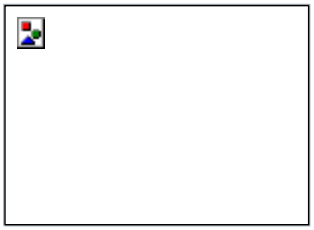
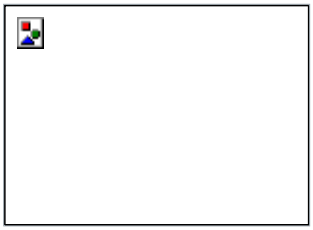
Grant Instruments offers three different ranges of data loggers - the Squirrel range of universal data loggers, the Yoyo range of small robust data loggers and the dataTaker® range of specialised rugged loggers, providing solutions from simple logging requirements to complex industry specific logging.

Grant Squirrel range of data loggers

The Grant Instruments Squirrel range of data loggers are easy to use, hand held, battery powered data loggers which can also be powered via a standard power socket (110-250 volts).

They set the standard for portable data loggers, with their simplicity of operation, very high accuracy of measurement, universal data inputs which can accept virtually any type of sensor signal and their excellent reliability.

The complete Squirrel range offers from 4 to 32 analogue sensor inputs channels, full Wi-Fi, USB and Ethernet connectivity and come complete with the sophisticated SquirrelView configuration and analysis software. Data logging is now truly possible - “out-of-the-box”.

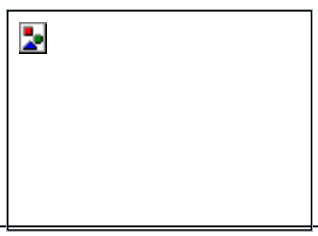
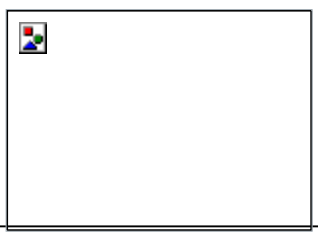
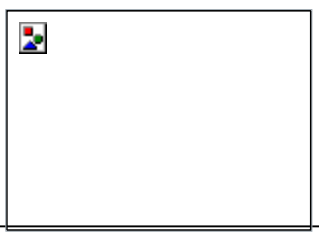
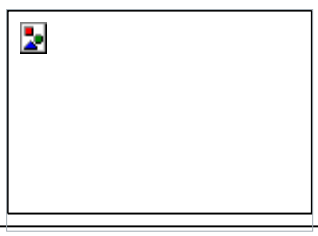





Grant Yoyo range of data loggers

The Yoyo range of data loggers are simple, battery operated, yet highly robust data loggers for measuring multiple types of physical parameters depending on the model. They feature high accuracy readings in a small, very robust enclosure.
The range include models with integrated measurement sensors, fixed external sensors and/or fully programmable input for interchangeable sensors.

They are used to measure parameters such as humidity, light, voltage, current, pressure and temperature. Due to their small size, they can be placed almost anywhere (indoors or out) and left unattended to collect data on the local conditions.

Yoyo loggers are suitable for a wide range of applications in environmental monitoring, agriculture, laboratories, R&D and building monitoring.

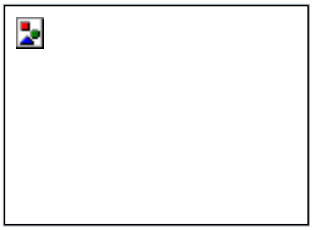
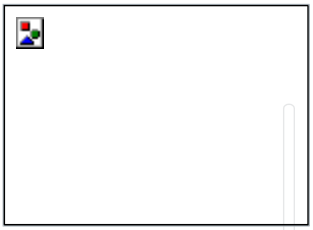
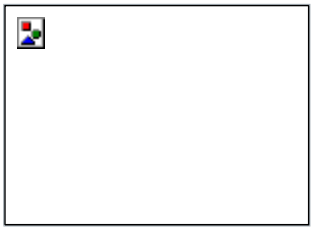
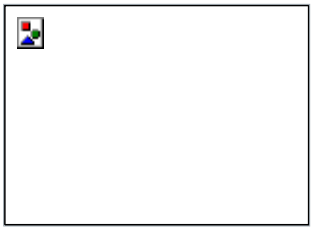





dataTaker® range of data loggers

dataTaker® is one of the world's leading brands of rugged, multi-purpose data loggers. The dataTaker® product range includes specialised products for environmental, industrial, geotechnical and scientific data capture and analysis.

These data loggers are compatible with almost all types of sensors and offer a high degree of programmability, thereby being ideal for remote or complex record / control applications found in the process, manufacturing and heavy industries.

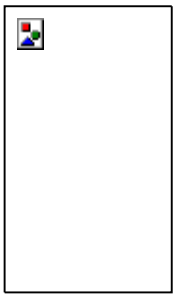
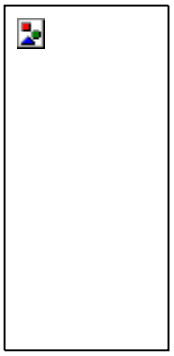
They feature a wide array of local and remote communication options allowing them to be placed in the area / region required whilst the user can be situated a long distance away and still easily access the data.

Contact us by email salesdesk@grantinstruments.com or phone +44 1763 260 811.

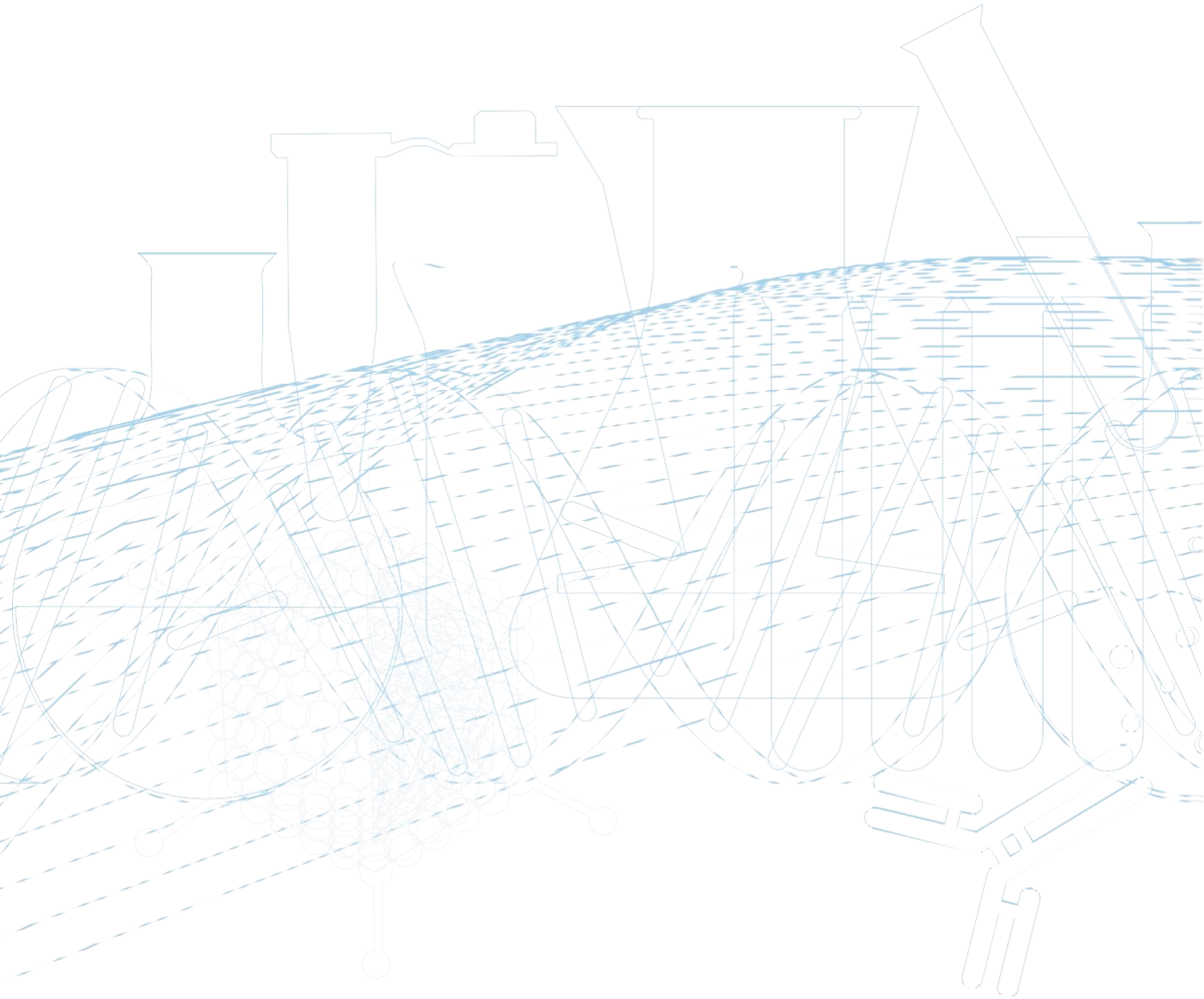
Other data acquisition products

Grant affiliate Eltek, part owned by Grant Instruments and also based near Cambridge, specialises in the design and manufacture of wireless data logging systems based on the Squirrel data logger. The Eltek GenII radio data logging system enables sensors to be connected to the Receiver Logger by means of a radio link, ideal where communications across a river, road or simply a large site need to be established quickly and effectively. Typical applications include monitoring of buildings (homes, cold stores, warehouses, museums, galleries, etc.), ground water monitoring and 'through process' monitoring in food production.

Please visit www.eltekdataloggers.co.uk for more information.

24 General information



General information

Safety

All Grant laboratory equipment meets the requirements of International Standard IEC 61010-1, Safety requirements for electrical equipment for measurement, control, and laboratory use and IEC 61010-2-010, Particular requirements for laboratory equipment for the heating of materials.

The above international standards are also published as European (EN 61010) and British (BS EN 61010).

All plastics used in Grant laboratory equipment are resistant to acids and to common laboratory solvents, and meet classification FVO or FV1 of IEC 707 (equivalent to V-0 or V-1 of UL94).

Electrical supplies

All standard Grant laboratory equipment is available for voltages within the range 220-240 V, 50 or 60 Hz, apart from RC recirculating chillers which may only be used on 50 Hz supplies. Most standard equipment is available for voltages within the range 110-120 V, 50 or 60 Hz. See individual specifications for details.

Environmental conditions

Grant laboratory equipment is designed for indoor use in laboratory conditions, with room temperature between 5°C and 40°C, and 80% relative humidity up to 31°C unless stated otherwise.

CE mark

All Grant laboratory equipment bears a CE mark to indicate that it meets the requirements of all applicable European Directives.

Compliance with the Low Voltage Directive is demonstrated by meeting EN 61010 (see paragraph above on safety) and the EMC Directive by meeting EN 61326-1: EMC requirements for electrical equipment for measurement, control and laboratory use.

Where appropriate Grant laboratory equipment conforms to IEC 61326-1 (EN 61326-1) Class B except where indicated.

Class B equipment is for use in domestic establishments, and in establishments directly connected to a low voltage power supply network which supplies buildings used for domestic purposes.

Class A equipment is suitable for use in establishments other than domestic and those directly connected to a low voltage power supply network, which supplies buildings used for domestic purposes.

Quality

The Grant Quality Management System complies with the requirements of BS EN ISO 9001:2008. It is Grant's policy to supply customers with products which are fit for their intended purpose, safe in use, perform reliably to published specification and are backed by a fast and efficient customer service.

After sales service

In the United Kingdom, repairs are carried out within three to five working days of arrival at our factory, or receipt of authorisation to repair. Refrigeration systems may take a few days longer, as they require more prolonged testing after repair. Alternatively, spare parts and service manuals can normally be despatched within two working days.

Most distributors of Grant equipment outside the UK hold stocks of spare parts, have their own service engineers and operate a similarly prompt repair service.

Guarantee

Grant equipment is robust and reliable, designed and built to provide years of trouble-free service.

All standard Grant scientific equipment is guaranteed for three years against faulty materials and workmanship. Grant bio equipment is guaranteed for two years, and application-specific equipment for one year. If repairs are carried out under guarantee, no charge is made for labour or materials, and within the United Kingdom we make no charge for carriage.

Performance figures

Except for refrigerated products, performance figures quoted apply to equipment used in ambient temperature between 10°C and 35°C. See individual specifications for details.

Stability figures quoted for baths/circulators are derived from tests made in accordance with DIN 58966 or DIN 12876. Both DIN standards require measurements to be taken as follows:

- at one point in the middle of the bath
- at one temperature
- during '100 fluctuations'
- without any test tubes or flasks in the baths
- stable ambient temperature
- stable supply voltage

Stability figures calculated using DIN 58966 discount the worst 25% of all temperature fluctuations.

The measurement procedure for stability of block heaters is similar, with measurements taken in the centre of a block.

Uniformity is measured at 37°C, using water in a bath, unless stated otherwise. Uniformity is defined as half the maximum temperature difference between any two points in the working space of a bath, or between any two tubes in a block heater.

Liquids

We recommend the following liquids for use in Grant baths:

- 50 to 50°C: Silicone fluid: Bayer Baysilone fluid M3
- 30 to 30°C: 50% water 50% antifreeze (inhibited ethylene glycol)

0 to 30°C: 80% water 20% antifreeze (inhibited ethylene glycol)

5 to 99.9°C: Water

50 to 150°C: Dow Corning silicone fluid DC200/20

150 to 260°C: Dow Corning silicone fluid DC210H/100

World wide availability and support for Grant laboratory equipment

Grant laboratory equipment and specialist technical support is available world-wide. Please visit **www.grantinstruments.com** for further product information and to locate your locally appointed distributor and support centre.

As Grant Instruments is committed to a continuous programme of improvement, specifications may be changed without notice.

About Grant

Founded in 1952, Grant Instruments (Cambridge) Ltd is a world renowned supplier and manufacturer of scientific, life science and data acquisition products.

The company has been designing, manufacturing and distributing scientific products for over 60 years and has established a worldwide reputation for high quality, reliable and robust systems designed to satisfy the most demanding applications for research, monitoring and temperature control across the globe.

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