

## 6 Stirred thermostatic baths and circulators

### Liquids

We recommend the following liquids for use in Grant baths:

- 30 to 30°C: 50% water 50% antifreeze  
(inhibited ethylene glycol)

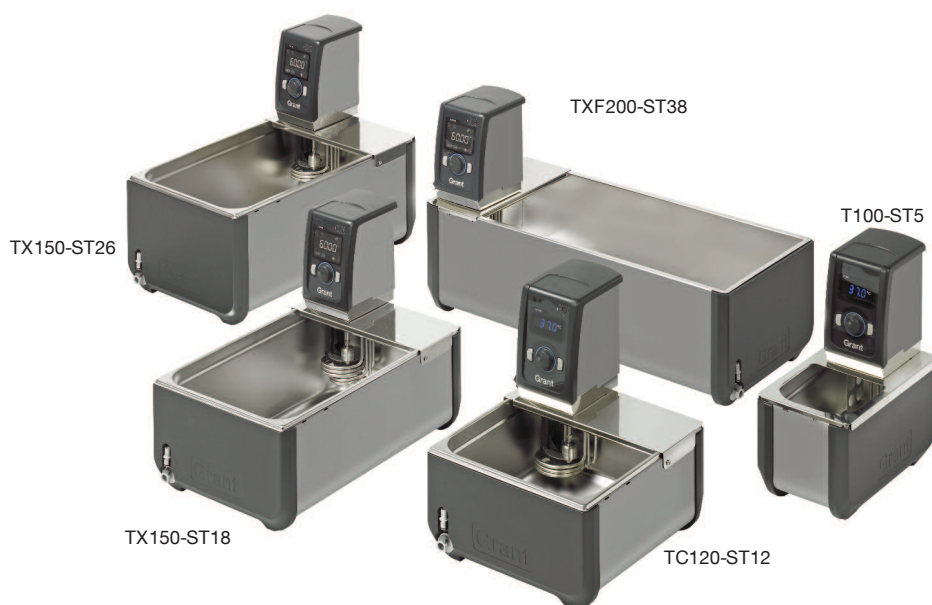
0 to 30°C: 80% water 20% antifreeze  
(inhibited ethylene glycol)

5 to 99.9°C: Water

# Stirred thermostatic 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 stirred 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



## Applications

Grant stirred baths and circulators provide a source of precision heating and cooling for many routine and sensitive analytical procedures including sample incubation, calibration and quality control testing. All models from the TC120 upwards are suitable for use as both open and closed loop circulators (i.e. remote vessel open or closed).

For more powerful heating requirements, i.e. above 200°C, contact Grant for advice.

## Model selection (operating temperature)

Any of the four Grant Optima™ digital thermostats 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 p. 6.6 shows you the temperature range of each combination.

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

## Stirred thermostatic baths and circulators » T100 - entry level showcase

### showcase 1 – entry level example

Model T100-ST12\* range 0 to 100°C, stability  $\pm 0.05^\circ\text{C}$

Well specified entry-level model with digital thermostatic control unit and stainless steel tank for straightforward laboratory applications requiring high precision temperature control.

- **Optima™ digital thermostat (T100) for precise temperature control**
- **Cooling/heating range 0 to 100°C\*\***
- **Stability  $\pm 0.05^\circ\text{C}$**
- **Easy to use rotary dial and two function keys for quick temperature setting and menu navigation**
- **Excellent temperature stability and uniformity**
- **3 programmable temperature presets**

**Visual alarm and countdown timer** – alerts you when your attention is required

**Simple-to-use rotor plus two function keys** for quick temperature setting and menu navigation

**User calibration facility** for optimum accuracy at the required operating temperature

**Comprehensive range of options and accessories** for a wide range of applications

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

**Raised feet** for carrying / repositioning and retort stand access

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



T100-ST12 model shown

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

**3 programmable temperature presets** for convenience

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



**Drain tap** allows easy emptying

**Low liquid protection and over-temperatures cut-out**

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

\* see summary table on pp. 6.6–6.7 for accessories and for other models utilising the T100 thermostat  
\*\* operation below ambient temperature requires accessory cooling

## showcase 2 – mid range example

Model TC120-ST12\* range 0 to 120°C, stability  $\pm 0.05^\circ\text{C}$

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

- Optima™ digital thermostat (TC120) for precise temperature control
- Integral pump for external fluid circulation
- Cooling/heating range 0 to 120°C\*\*
- Stability  $\pm 0.05^\circ\text{C}$
- 3 programmable temperature presets
- Easy to use rotary dial and two function keys

**Visual alarm and countdown timer** – alerts you when your attention is required

**Simple-to-use rotor plus two function keys** for quick temperature setting and menu navigation

Convenient **timer function** for reaction timing

**User calibration facility** for optimum accuracy at the required operating temperature

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

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



TC120-ST12 model shown

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

Operating setpoint plus **3 adjustable preset temperatures** 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

**Liquid protection and adjustable over-temperature cut-out**

**Drain tap** allows easy emptying

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

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



\* see summary table on pp. 6.6–6.7 for accessories and for other models utilising the TC120 thermostat

\*\* operation below ambient temperature requires accessory cooling

## showcase 3 – high specification example

Model TXF200-ST26\* range -15 to 200°C, stability  $\pm 0.01^\circ\text{C}$

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  $\pm 0.01^\circ\text{C}$**
- **Cooling/heating range -15 to 200°C\*\***
- **Full colour QVGA TFT screen**
- **Easy to program via interface or remote via PC or Laptop using Labwise™ software**
- **Key functions easily accessed via home screen icons**

TXF200-ST26 model shown

**Full colour QVGA TFT 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

**Two-point user calibration** for optimum accuracy

**Countdown timer** alerts when your attention is required

**Drain tap** allows easy emptying

**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

**High power integral pump for external fluid circulation** – variable speed, 23L/min, 530mBar

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



\* see summary table on p. 6.6–6.7 for accessories and other models utilising the Grant high performance digital control units  
\*\* operation below ambient temperature requires accessory cooling

## showcase 4 – budget example

Model T100-P12\* range ambient + 5 to 99°C, stability  $\pm 0.05^\circ\text{C}$

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 to 99°C
- Stability  $\pm 0.05^\circ\text{C}$
- 3 programmable temperature pre sets
- Low liquid protection and over-temperature cut-out

**Visual alarm** – alerts you when your attention is required

**Simple-to-use rotor 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**



T100-P12 model shown

**Low liquid protection and over-temperature cut-out**

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

**Wide range of optional accessories** for different applications

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

\* see summary table on p. 6.6 for accessories and for other models utilising T100 control units and/or plastic tanks

## Stirred thermostatic baths and circulators » Models, options and accessories

### Stirred thermostatic baths and circulators – 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. 6.8

#### Effective operating temperature range†

(tank + thermostat)

	ambient +15 to 99°C
	ambient + 5 to 99°C
	0 to 100°C
	0 to 120°C
	0 to 150°C
	0 to 200°C
	-15 to 120°C
	-15 to 150°C
	-15 to 200°C

† operation at or below ambient temperatures requires accessory cooling

#### Key to symbols

	display		fixed over temperature cutout		visual alarm
	timer		relay		2 point recalibration
	pump		audible alarm		external probe
	offset adjustment		menu system		programmable
	program storage		USB		
			adjustable overtemperature cutout		

#### Thermostatic control units

General purpose digital		Advanced digital	
T100	TC120	TX150	TXF200
h: 335mm d: 172 mm w: 120 mm	h: 335 mm d: 172 mm w: 120 mm	h: 345 mm d: 172 mm w: 120 mm	h: 345 mm d: 172 mm w: 120 mm

#### Tanks

Capacity (L) Outer tank dimensions	Working area (l x w) • Min/max liquid depths • Inner tank dimensions (l x w x h) • Overall dimensions incl. controller (l x w x h)	System designation (tank + control unit)			
<b>ST5 – 5 L stainless steel</b>  h: 200 mm l: 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	TC120-ST5	TX150-ST5	TXF200-ST5
<b>ST12 – 12 L stainless steel</b>  h: 200 mm l: 360 mm w: 330 mm	• 205 x 300 mm • 85/140 mm • 325 x 300 x 150 mm • 360 x 330 x 395 mm	T100-ST12 (showcased on page 6.2)	TC120-ST12 (showcased on page 6.3)	TX150-ST12	TXF200-ST12
<b>ST18 – 18 L stainless steel</b>  h: 200 mm l: 540 mm w: 330 mm	• 385 x 300 mm • 75/130** mm • 505 x 300 x 150 mm • 540 x 330 x 395 mm	T100-ST18	TC120-ST18	TX150-ST18	TXF200-ST18
<b>ST26 – 26 L stainless steel</b>  h: 255 mm l: 540 mm w: 330 mm	• 385 x 300 mm • 125/180** mm • 505 x 300 x 200 mm • 540 x 330 x 405 mm	T100-ST26	TC120-ST26	TX150-ST26	TXF200-ST26 (showcased on page 6.4)
<b>ST38 – 38 L stainless steel</b>  h: 255 mm l: 730 mm w: 330 mm	• 575 x 300 mm • 125/180** mm • 690 x 300 x 200 mm • 730 x 333 x 450 mm	T100-ST38	TC120-ST38	TX150-ST38	TXF200-ST38
<b>P5 – 5 L plastic</b>  h: 180 mm l: 240 mm w: 330 mm	• 120 x 150 mm • 85/140 mm • 240 x 160 x 150 mm • 390 x 200 x 380 mm	T100-P5	TC120-P5	TX150-P5	TXF200-P5
<b>P12 – 12 L plastic</b>  h: 180 mm l: 415 mm w: 350 mm	• 210 x 280 mm • 85/140 mm • 325 x 280 x 150 mm • 415 x 350 x 380 mm	T100-P12 (showcased on page 6.5)	TC120-P12	TX150-P12	TXF200-P12
<b>P18 – 18 L plastic</b>  h: 180 mm l: 600 mm w: 365 mm	• 280 x 325 mm • 85/140 mm • 510 x 290 x 150 mm • 600 x 350 x 380 mm	T100-P18	TC120-P18	TX150-P18	TXF200-P18

#### Options and accessories

##### Labwise™ PC software (optional)

Allows two-way communication for status display, programming and data capture (see p. 16.1 for more information) USB cable provided

##### External probes (optional) for monitoring and controlling temperature of remote loads

TXPEP flexible plastic probe, 3 m cable

TXSEP stainless steel probe, 3 m cable

##### Remote switching device (optional)

For switching appliances on and off (up to max. 8 Amps)

##### Vertical turbine pumps (optional)\*

Low noise, compact design. Supplied with pipe connections and special lid for fitting to tank, pipe bore 12.7 mm

**VTP 1**  
max. pressure 1000 mbar  
max. flow 9 L/min

**VTP 2**  
max. pressure 1650 mbar  
max. flow 12 L/min



Required only where application demands a higher pressure than that delivered by the internal pump to maintain flow



























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

## Stirred thermostatic baths and circulators » Options and accessories

**Glossary** (see also options and accessories section)

2 point calibration	Provides calibration across wide temperature range with high and low reference points, used to re-set calibration of instrument.
Offset adjustment	Allows accurate temperature control where the monitored temperature is different from the target temperature, often used in conjunction with an external probe
Pump	Enables fluid to be circulated externally instead of within the bath. Typically to provide temperature control to a remote instrument (tubing and connectors not supplied)

### Accessories

Lids* to help reduce evaporation/heat loss and avoid sample contamination	Polypropylene spheres* (no. of packs required) 300 spheres in one pack	Rack systems† to optimise use of available bath capacity (no. of racks accommodated)	Raised shelves to allow shallow vessels to be accommodated	Accessory cooling systems**		
				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)
<b>STL5</b>  flat stainless steel	1 x PS20	1 x QR			-	
<b>STL12</b>  gabled, hinged (removable) stainless steel	1 x PS20	2 x VR	<b>RS14</b> 		-	
<b>STL26</b>  gabled, hinged (removable) stainless steel	2 x PS20	4 x VR	<b>RS22</b> 		-	
<b>STL26</b>  gabled, hinged (removable) stainless steel	2 x PS20	4 x VR	<b>RS28</b> 			
<b>STL38</b>  gabled, hinged (removable) stainless steel	3 x PS20	6 x VR	<b>RS28 or RS38</b> 			
<b>PL5</b>  flat, stainless steel	1 x PS20	1 x QR	-	-	-	-
<b>PL12</b>  curved plastic	1 x PS20	2 x VR	<b>RS14</b> 	-	-	-
<b>PL18</b>  curved plastic	2 x PS20	4 x VR	<b>RS22</b> 	-	-	-

\* Between operating temperatures 60°C and 100°C and below room temperature a lid or layers of polypropylene spheres should be used. Above 60°C a lid must 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 room temperature + 5°C (room temperature + 15°C for P5 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







## Stirred thermostatic baths and circulators » Technical specifications

### Stirred thermostatic baths and circulators – technical specifications

#### Grant Optima™ thermostats

● = standard

			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 to 9999 mins	1 min to 99 hrs 59 mins	
No. of pre-set temperatures			3	3	3	3
Recalibration points			2	2	2	2
Offset adjustment			–	–	●	●
Socket for external probe (TXPEP, TXSEP)			–	–	●	●
Communications interface			–	–	USB	USB
Programmable			–	–	remote via PC 1 program / 30 segments	direct via user interface or remote via PC/laptop 10 programs / 100 segments
Relays			–	–	1	1
Safety	overtemperature		fixed		adjustable cut-out	
	fluid level – float		●	●	●	●
Alarms (can be configured to switch a 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 (50-60 Hz)	1.4 (50 Hz)	2.0 (50 Hz)	2.0 (50-60 Hz)
	120 V	kW	1.5 (50-60 Hz)	1.5 (60 Hz)	1.5 (60 Hz)	1.5 (50-60 Hz)
Height above tank rim	mm		200	200	200	200
Depth below tank rim	mm		135	135	135	135



#### Grant Optima™ thermostat pumps (integral)

Maximum pressure	water	mbar		210	310	530
Maximum flow	water	L/min		16	18	23 (adjustable flow rate)
Pipe bore	inlet/outlet	mm		6, 11	6, 11	6, 11




Grant immersion thermostats are suitable for use with Grant stainless steel and plastic tanks. With the addition of a clamp (T clamp) they can also be attached to any vertical sided tank with a maximum wall thickness of 35 mm for rectangular 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.

## Stirred thermostatic baths and circulators » Technical specifications

### 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			30	40
Power output to liquid @ 20°C			15*	22*
Safety			thermal fuse	thermal fuse

### Grant accessory cooling systems

			Refrigerated 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			300	500	-
Dimensions	d/w/h	mm	460/305/225		-
Flexible pipe	l	mm	925	925	-
Coil	Ø / l	mm	77/55	77/55	77/55
Pipe bore inlet/outlet			-	-	7
Electrical supply			120 V (60 Hz) or 230 V (50Hz)		-

\* The VTP optional pumps will transfer additional heat to the baths, so the minimum temperature achievable with or without accessory cooling will be increased.  
 Note: when ordering a VTP pump, please specify which Grant tank it is to be used with.



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**Use the above details to contact us if this literature doesn't answer all your questions.**

**Pricing on any accessories shown can be found by keying the part number into the search box on our website.**

The specifications listed in this brochure are subject to change by the manufacturer and therefore cannot be guaranteed to be correct. If there are aspects of the specification that must be guaranteed, please provide these to our sales team so that details can be confirmed.

