grant

Heated Circulators and Stirrers

Optima™ range

Heated circulating baths

Optima™

Heated circulating and stirred baths

Our series of high-precision temperature control systems offer accurate and safe temperature control. The product portfolio is designed for any application, giving precise temperature control, reliability, quality and safety. We offer a wide range of affordable solutions from entry-level through to advanced products, with accessories to match specific needs.

Accurate and safe temperature control - for safe operation and regulated speed control

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Intuitive operation and user-friendly features - simple menu navigation and programming function for precise temperature control

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Robust and durable - made of high-quality materials and designed for a long service life

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Entry-level to advanced-level - 32 models across the series to meet application challenges and budgets

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3 year warranty

Built in Britain

Precision temperature control products for every application

Our four Grant Optima™ heated circulators can be combined with any of our eight tanks, offering 32 models in total to choose from. If you cannot find the right Optima™ unit in our standard product range, we have a specialist Custom Solutions team that are on hand to help with your individual needs.

Optima™ heated circulators and stirred baths

T100, TC120, TX150 and TXF200

Our comparison illustrates the features and benefits of all four Optima™ products. Choose from our two standard products, the T100 and TC120 or two of our more advanced models, the TX150 and TXF200. Combine any of heated circulators with a stainless steel or plastic tank or use independently with a T-Clamp for added value.

T100	TC120	TX150	TXF200
General purpose digital		Advanced digital	
Ambient +5 to 100°C	Ambient +5 to 120°C	Ambient +5 to 150°C	Ambient +5 to 200°C
Features	Benefits	Features	Benefits
Stability ±0.05°C.	Superior temperature stability and temperature control for demanding applications.	Stability ±0.01°C.	Superior temperature stability and temperature control for demanding applications.
Clear, bright 4 digit LED display.	View control and process data with clear and easy to read display.	Large, bright LED full colour display.	View control and process data with clear and easy to read display.
Simple, intuitive user interface, with 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 only).	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 or without T-Clamp.	Conveniently converts vessels into a stirred bath, offering excellent versatility.	Model available with or without T-Clamp.	Converts vessels into a stirred bath, offering excellent versatility.
Low-fluid detection (float switch).	Unit will cut-out when fluid level is too low for operation. Peace of mind that the unit will safely operate unattended.	Low-fluid detection (float switch).	Unit will cut-out when fluid level is too low for operation. Peace of mind that the unit will safely operate unattended.
User adjustable over temperature dial (TC120 only).	Independent safety feature and sample protection.	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.
Fixed over temperature (T100 only).	Independent safety feature.	User adjustable over temperature dial.	Independent safety feature and sample protection.
Visual alarm.	Alerts you when your attention is required.	Displays with a choice of five languages (EN, DE, FR, ES & IT).	-
2 point user calibration.	Provides optimum accuracy at temperatures important to the user.	USB/RS232 interface.	Allows connection to PC or laptop for programming or data logging.
Countdown timer (TC120 only).	Offers convenient reaction timing.	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.

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, viscometry, cosmetics testing

Package example A - entry level

Model T100-P12* temperature range - +5° - 99°C**

Entry-level model with digital thermostatic control unit and plastic tank suited for standard applications that need to achieve accurate temperature control.

Visual alarm - alerts you when your attention is required.

Simple-to-use rotary 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.

Choices of **120V and 230V models.**

* See summary table on page 18 - 19 for accessories and for other models using T100 control units and or plastic tanks.

Product highlights

- Stirrer and heated circulator
- Optima™ digital thermostat (T100) for accurate temperature control
- Temperature range ambient +5°C to 99°C
- Stability: ±0.05°C
- Three programmable temperature pre-sets
- Low fluid protection and fixed over temperature cut-out
- 12L plastic tank with optional lid

Operating set point 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.

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

Applications

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

Package example B - mid-level

Model TC120-ST12* temperature range - 0° - 120°C**

Versatile mid-level model with digital thermostatic control unit, stainless-steel tank and diverse specifications for a broad range of applications that need precision temperature control.

Clear four digit display - easy to read from a distance for instant reassurance.

Dual position bridge-plate - ensures visibility and accessibility of the thermostat and optimises bench space.

Fluid level protection and adjustable over temperature cut-out to protect the samples and the user.

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

Drain tap - allows easy emptying.

* See summary table on page 18-19 for accessories and for other models using TC120 heated circulator.
** Operation below ambient temperature requires optional accessory cooling.

Product highlights

- Circulator and stirrer
- Optima™ digital thermostat (TC120) for precision temperature control
- Cooling/heating range 0°C to 120°C**
- Stability: ±0.05°C
- Uniformity: ±0.1°C
- Three programmable temperature pre-sets
- 12L stainless steel tank with optional lid*

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

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

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

Powerful integral pump for external fluid circulation - variable speed, 22L/min, 530mbar.

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

Raised feet for carrying and repositioning, and retort stand access.

Applications

- Clinical, microbiology and pathology labs - media tempering, thawing and 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

Package example C - advanced specification

Model TXF200-ST12* temperature range - up to 200°C**

Advanced-level with high performance digital thermostat and stainless-steel tank for sophisticated applications needing complex programming and or ultra-precise temperature control.

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

Socket for optional external probe - allows remote temperature control.

Memory capacity for 10 programmes containing 100 segments.

Five point user calibration facility for optimum accuracy.

Drain tap - allows easy emptying.

* See summary table on page 18-19 for accessories and for other models utilising the Grant high performance digital control units.
** Operation below ambient temperature requires optional accessory cooling.

Product highlights

- Circulator and stirrer
- Optima™ high performance digital thermostat (TXF200) for ultra-precise temperature control
- Stability: ±0.01°C
- Uniformity: ±0.05°C
- Easy to program via interface or remotely via PC/Laptop using Labwise® software
- Key functions easily accessed via home screen icons
- 12L stainless steel tank with hinged lid

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

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

High and low temperature alarm settings - visual, audible and programmable.

Powerful integral pump for external fluid circulation - variable speed, 22L/min, 530mbar.

Accessory cooling systems allow operation at or below ambient temperature. See page 19 for details.

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

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

Package example D - with accessory cooler

Model TX150-ST12* with C1G temperature range - 0°C up to 40°C**

Refrigerated immersion coolers consist of a cooling coil connected to a refrigeration unit by a flexible pipe. Designed to extract heat continuously, the digital thermostat controls the temperature.

Powerful integral pump - allows circulation of temperature controlled to external equipment (16L/min, 210 mbar)

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

Drain tap - allows easy emptying.

Raised feet for carrying and repositioning, and retort stand access.

* See summary table on page 18-19 for accessories and for other models utilising the Grant high performance digital control units.
** Operation below ambient temperature requires optional accessory cooling.

Product highlights

- Circulator and stirrer
- Optima™ high performance digital thermostat (TX150) for ultra-precise temperature control
- Cooling/heating range 0° to 40°C**
- Stability: ±0.01°C
- Uniformity: ±0.05°C
- C1G immersion cooler
- 12L stainless steel tank with hinged lid

Adjustable plate on tank bridgeplate allows for secure fixing of the cooling coil.

Convenient bridgeplate ensures no working space is lost.

3 adjustable temperature presets for convenience.

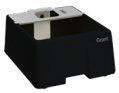
Applications

- University research - temperature control of external equipment such as electrophoresis tanks or jacket vessels
- Industrial labs - temperature probe calibration

Heating circulating and stirred 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 comparison shows the temperature range of each combination. For more details of Grant Optima™ heated circulators, see page 18. Custom tanks are available on request.

			General purpose digital		Advanced digital	
			T100	TC120	TX150	TXF200
Capacity (L)		Outer tank dimensions • Dimensions (h x d x w) Weight (kg) • Working area (d x w) • Min/max fluid depths • Inner tank dimensions (h x d x w)				
ST5 - 5L stainless steel		• 215 x 335 x 187mm, 2.9kg • 150 x 260mm • 85/140mm • 150 x 300 x 150mm	T100-ST5 amb. +15°C to 100°C	TC120-ST5 0°C to 120°C	TX150-ST5 0°C to 150°C	TXF200-ST5 0°C to 200°C
ST12 - 12L stainless steel with drain tap		• 215 x 332 x 360mm, 4.5kg • 205 x 300mm • 85/140mm • 150 x 325 x 300mm	T100-ST12 0°C to 100°C	TC120-ST12 0°C to 120°C	TX150-ST12 0°C to 150°C	TXF200-ST12 0°C to 200°C
ST18 - 18L stainless steel with drain tap		• 215 x 545 x 340mm, 7.3kg • 385 x 300mm • 75/130**mm • 150 x 505 x 300mm	T100-ST18 0°C to 100°C	TC120-ST18 0°C to 120°C	TX150-ST18 0°C to 150°C	TXF200-ST18 0°C to 200°C
ST26 - 26L stainless steel with drain tap		• 270 x 535 x 340mm, 7.7kg • 385 x 300mm • 125/180**mm • 200 x 505 x 300mm	T100-ST26 0°C to 100°C	TC120-ST26 -15°C to 120°C	TX150-ST26 -15°C to 150°C	TXF200-ST26 -15°C to 200°C
ST38 - 38L stainless steel with drain tap		• 260 x 733 x 338mm, 11.9kg • 575 x 300mm • 125/180**mm • 200 x 690 x 300mm	T100-ST38 0°C to 100°C	TC120-ST38 -15°C to 120°C	TX150-ST38 -15°C to 150°C	TXF200-ST38 -15°C to 200°C
P5 - 5L plastic		• 180 x 323 x 220mm, 2.2kg • 120 x 150mm • 85/140mm • 155 x 240 x 160mm	T100-P5 amb. +15°C to 99°C	TC120-P5 amb. +15°C to 99°C	TX150-P5 amb. +15°C to 99°C	TXF200-P5 amb. +15°C to 99°C
P12 - 12L plastic		• 180 x 412 x 340mm, 3.4kg • 210 x 280mm • 85/140mm • 155 x 325 x 280mm	T100-P12 amb. +5°C to 99°C	TC120-P12 amb. +5°C to 99°C	TX150-P12 amb. +5°C to 99°C	TXF200-P12 amb. +5°C to 99°C
P18 - 18L plastic		• 180 x 589 x 340mm, 5.1kg • 375 x 280mm • 85/140mm • 155 x 510 x 290mm	T100-P18 amb. +5°C to 99°C	TC120-P18 amb. +5°C to 99°C	TX150-P18 amb. +5°C to 99°C	TXF200-P18 amb. +5°C to 99°C

Note: Operation at or below ambient temperatures requires optional accessory cooling (19) or a refrigeration unit (section 2.1)

* 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.

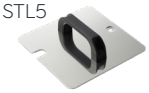
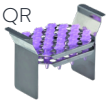
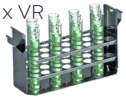
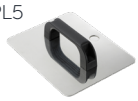
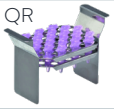
VR Racks	Tube size	Capacity	VR Racks	Tube size	Capacity
VR-13	10-13mm	65	VR-30	30mm	14
VR-19	16-19mm	36	VR-SE	0.5ml	102
VR-24	24mm	23	VR-LE	1.5ml	75

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

Fluids

When using our baths, we recommend that the following fluids for used.

-50°C to 50°C:	Silicone oil - low viscosity (Bayer silicone M3)
-30°C to 30°C:	50% water, 50% antifreeze (inhabited ethylene glycol)
0°C to 30°C:	80% water, 20% antifreeze (inhabited ethylene glycol)
5°C to 99.9°C:	Water - do not use to boil 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, flash point ≥ 285°C, fire point ≥ 340°C)

Lids*	Lids*	Polypropylene	Rack systems †	Raised shelves	Optional accessory cooling systems**		
					Refrigerated immersion coolers		Heat exchange coil
Reduces evaporation/ heat at loss and prevent sample contamination.	For continuous use with water above 90°C. Stainless steel.	300 spheres in one pack - no. of packs required.	Optimises use of available bath capacity - no. of racks accommodated.	To allow shallow vessels to be accommodated	Consists of a cooling coil connected to a refrigeration unit by a flexible pipe. Extract heat continuously, with the heated circulator controlling the temperature.		Designed to attach to a cold-water source or a refrigerated circulator.
					C1G (0°c to 40°c***)	C2G (-15°c to 40°c***)	CW5 (2°C above coolant temperature)
STL5 	-	1 x PS20	1 x QR 	-		-	
STL12	STL12	1 x PS20	2 x VR	RS14		-	
STL26	STL26	2 x PS20	4 x VR	RS22		-	
STL26	STL26	2 x PS20	4 x VR 	RS28			
STL38	STL38	3 x PS20	6 x VR	RS28 or RS38			
PL5 	-	1 x PS20	1 x QR 	-	-	-	-
PL12	-	1 x PS20	2 x VR	RS14	-	-	-
PL18	-	1 x PS20	4 x VR	RS22	-	-	-

* 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 fluids up to 100°C with the cooler switched off and may be used to cool fluid 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 (number of test tubes per rack).

Heated circulating baths
Options and accessories

		General purpose digital		Advanced digital	
		T100	TC120	TX150	TXF200
Labwise™ PC software (optional)					
Allows two-way communication for status display, programming and data capture (see page 36 for more information) USB/RS232 cables provided.		–	–	•	•
External probes (optional) for monitoring and controlling temperature of remote loads					
TXPEP flexible plastic probe, 3m cable (3.5mm Jack plug)		-	-	•	•
TXSEP stainless steel probe, 3m cable (3.5mm Jack plug)		-	-	•	•

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	230V		
Max. flow	9 L/min	50Hz		
VTP 2				
Max. pressure	1650	230V		
Max. flow	12 L/min	50Hz		

High pressure pumps
Optional

		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 fluid " 20°C	W	15*	22*
Safety		Thermal fuse	Thermal fuse

* 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.

Accessory cooling systems

Optional

		Immersion coolers		Heat exchange coil
		C1G	C2G	CW5
Cooling Power	@ 29°C W	350	400	–
	@ 0°C W	110	320	–
	@ -10°C W	–	170	–
Overall consumption	VA	300	500	–
Dimensions (d x w x h)	mm	485 x 305 x 320		130 x 100 x 150
Weight	kg	16.6	19.6	0.1
Flexible pipe	l mm	925		–
Coil	ø/l mm	50/100		
Pipe bore inlet/outlet	mm	–	–	7
Electrical supply	V	120 (60Hz) or 230 (50Hz)		–

Pump connectors

Optional

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

Clamp
Optional

	T-Clamp	
Grant heated circulators are ideal for use with Grant stainless steel and plastic tanks. With the addition of a clamp (T-Clamp) they can also be attached to virtually any vertical sided tank with a maximum wall thickness of 35mm for rectangular tanks, 30mm for circular tanks (300mm diameter), and a capacity of up to 50 litres. Minimum and maximum temperatures achievable are dependent on the tank insulation and minimum operating temperature depends on the accessory cooling device.		

Bridgeplates
Optional

	Bridge plates for use with stainless steel tanks
Bridge plate fits G Optima™* heating circulator models to ST5 tank	G-BTS
Bridge plate fits G Optima™* heating circulator models to ST12, 18, 26 & 38 tanks	G-BTL
Bridge plate replacement fits T Optima™ heating circulator models to ST5 tank	T-BTS
Bridge plate replacement fits T Optima™ heating circulator models to ST12, 18, 26 & 38 tanks	T-BTL
Bridge plate fits T Optima™ heating circulator models to S5 tank	T-BSS
Bridge plate fits T Optima™ heating circulator models to S12, 18, 26 & 38 tanks	T-BSL
Bridge plate fits T Optima™ heating circulator models to Y6 & W6 tanks	T-BYWS
Bridge plate fits T Optima™ heating circulator models to Y14, 28 & 38 tanks also W14, 28 & 38 tanks	T-BYWL

	Bridge plates for use with plastic tanks
Bridge plate fits G Optima™* heating circulator models to P5 tank	G-BPS
Bridge plate fits G Optima™* heating circulator models to P12 & 18	G-BPL
Bridge plate replacement fits T Optima™ heating circulator models to P5 tank	T-BPS
Bridge plate replacement fits T Optima™ heating circulator models to P12 & 18 tanks	T-BPL

* G Optima™ is the previous edition of the Optima™.

Optima™ heated circulators

Technical specifications

		Grant Optima™ Heated circulators and Immersion thermostat			
		T100	TC120	TX150	TXF200
Dimensions	h x d x w mm	333 x 172 x 120	333 x 172 x 141	342 x 172 x 141	
Stability (DIN) 12876)	@70°C ±°C	0.05		0.01	
Uniformity (Din 12876)	@70°C ±°C	0.1		0.05	
Setting resolution	°C	0.1		0.1 (0.01 with Labwise*)	
Display		4 digit LED		Full colour QVGA TFT	
Timer function		-	1 minutes to 99 hours 59 minutes		
No. of temperature presets		3			
Re-calibration points		2		5	
Socket for external probe (TXPEP, TXSEP)		-		•	
Communications interface		-		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	
Safety	over temperature	Fixed	Adjustable cut-out		
	fluid level - float	•			
Language options		-		EN, FR, DE, IT, ES	EN, FR, DE, IT, ES
Alarms (can be configured to switch a relay)		-	High (no relay)	High and low	
Heater power	230V W	1290		1840	
	120V W	1440		1445	
Electrical power	230V W	1400 (50-60Hz)		2000 (50-60Hz)	
	120V W	1500 (50-60Hz)			
Height above tank rim	mm	200			
Depth below tank rim	mm	135		145	
Maximum pressure	water mbar	-	210	310	530
Maximum flow	water L/min	-	16	18	22 (adjustable flow rate)
Pump connector	6mm bore*	-	Fits 9mm inner diameter tubing		
Pump connector	11mm bore*	-	Fits 15mm inner diameter tubing		
Weight	kg	2.1	2.3	2.6	

* 6 and 11mm bore pump connectors supplied as standard. For more options see page 1.6.

• = standard

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