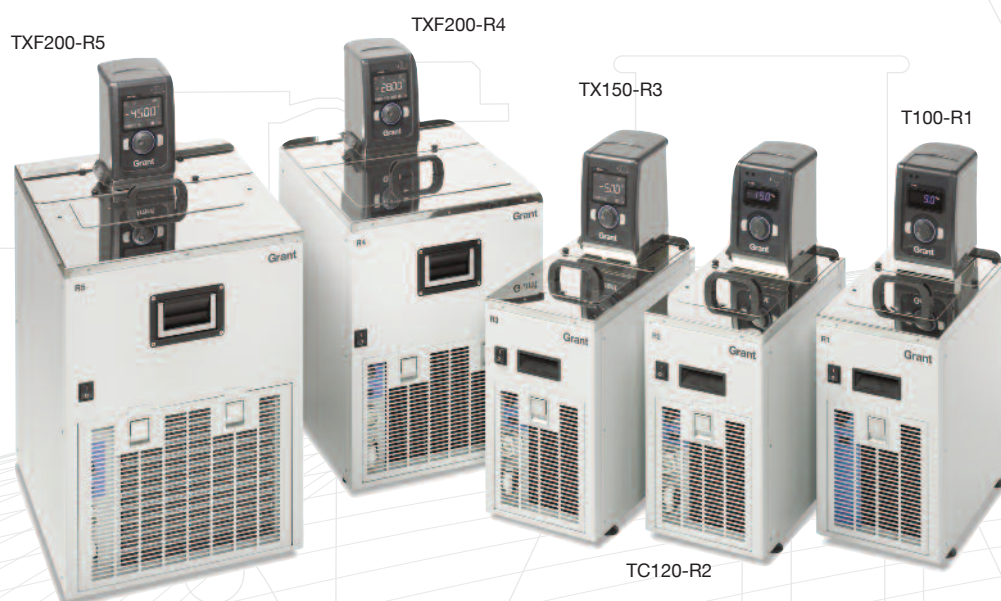


Refrigerated/heating circulating baths » Optima™ range

Optima refrigerated / heating baths and circulators

Cost-effective and efficient multi-purpose systems for low temperature applications.

- **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** – 18 models to cover basic through to sophisticated needs
- Market leading 3 year warranty



Operating temperature

The four Grant Optima™ thermostats can be combined with Grant refrigeration units to provide a choice of 18 models. The colour-coded summary table on p. 2.4 shows you the temperature range of each combination.

The following page showcases our most popular model, the versatile mid-range TC120-R2.

Liquids

We recommend the following liquids for use with refrigerated thermostatic baths and circulators:

- 50 to 50°C: Silicone oil – low viscosity
(Bayer silicone 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

Refrigerated / heating circulating baths » TC120-R2 mid range showcase

showcase – mid range example

Model TC120-R2 range -20 to 100°C, stability $\pm 0.1^\circ\text{C}$

Our most popular model – a versatile system for the laboratory, with a comprehensive specification to suit most low temperature applications.

- Optima™ digital thermostat (TC120) for precise temperature control
- Cooling/heating range -20°C to 100°C
- Stability $\pm 0.1^\circ\text{C}$
- Easy to use rotary dial and two function keys

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

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

User calibration facility for optimum accuracy at the required operating temperature

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

Low liquid protection and over temperature cut-out

Easy access to coolant reservoir for local cooling of tubes, bottles etc

Easily accessible power switch

Powerful efficient cooling, ozone-friendly refrigerant

Removable grille – easy access to drain valve* and condenser for routine maintenance

*Drain valve not available on R1 systems



Also available as a kit (LTC2) see page 2.6

Adjustable over temperature protection provides sample protection

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

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

Convenient carrying handles front and rear for repositioning the unit

Designed for quiet operation for minimal impact on your working environment

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

5°C thermostat on/off switch – stops tank freezing when operating with water

Applications:

- University research/teaching - temperature control of external equipment including: spectrophotometers & refractometers. Circulation of temperature control fluid to jacketed vessels, cooling crystallisation vessels
- Industrial laboratories - temperature probe calibration, product testing, product QC, temperature control of external equipment

Refrigerated / heating circulating baths » Models, options and accessories

Refrigerated / heating circulating baths – models, options and accessories

Effective operating temperature range (refrigeration unit + thermostat)

- 0°C to 100°C
- 20°C to 100°C
- 30°C to 100°C
- 47°C to 100°C

Key to symbols

- | | | |
|-----------------|--|------------------------|
| display | fixed over temperature cutout relay/ relay control | visual alarm |
| timer | audible alarm | 5 point re-calibration |
| pump | menu system | external probe socket |
| USB/RS232 | programmable | 2 point recalibration |
| drain | refrigeration high pressure switch | |
| program storage | adjustable over temperature cutout | |

Thermostatic control units

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

Refrigeration units

Capacity (L) Outer tank dimensions	Working area (l x w) Min/max liquid depths Weight				
R1 – 5 L stainless steel h: 410 mm d: 410 mm w: 230 mm	• 110 x 145 mm • 85/140 mm • 20 kg				
R2 – 5 L stainless steel h: 410 mm d: 410 mm w: 230 mm	• 110 x 145 mm • 85/140 mm • 20 kg 				
R3 – 5 L stainless steel h: 410 mm d: 410 mm w: 230 mm	• 110 x 145 mm • 85/140 mm • 21 kg 	-	-		
R4 – 20 L stainless steel h: 530 mm d: 490 mm w: 390 mm	• 230 x 305 mm • 85/140 mm • 40 kg 				
R5 – 12 L stainless steel h: 585 mm d: 575 mm w: 415 mm	• 260 x 115 mm • 125/180 mm • 47 kg 				

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 (optional)

TXPEP flexible plastic probe, 3 m cable

TXSEP stainless steel probe, 3 m cable

Remote switching device (optional)

For switching mains powered 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.

Refrigerated / heating circulating baths » Technical specifications

Low temperature refrigerated baths and circulators – technical specification

Grant Optima™ thermostats



● = standard

	General purpose digital		Advanced digital	
	T100	TC120	TX150	TXF200
				
Stability (DIN 12876) water @ 10°C	°C	±0.1	±0.1	±0.1
-10°C for 50% water, 50% glycol	°C	–	±0.1	±0.1
Uniformity (DIN 12876) water @ 10°C	°C	±0.1	±0.1	±0.1
-10°C for 50% water, 50% glycol	°C	–	±0.1	±0.1
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 6000 mins	1 min to 99 hrs 59 mins	
No. stored temperature values	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/30segments	via user interface/remote via PC / laptop 10 programs/100segments
No. stored programs	–	–	1 x 30 segment	10 x 100 segment
Relays	–	–	1	1
Safety over temperature	fixed	–	adjustable cut-out	
fluid level – float switch	●	●	●	●
Alarms (can be configured to switch a relay)	–	high (no relay)	high and low	high and low
Language capability	–	–	EN, FR, DE, IT, SP	EN, FR, DE, IT, SP
Heater power 230 V	kW	1.3	1.3	1.9
120 V	kW	1.4	1.4	1.4
Electrical power 230 V	kW	1.4 (50-60 Hz)	1.4 (50 Hz)	2.0 (50 Hz)
120 V	kW	1.5 (50-60 Hz)	1.5 (60 Hz)	1.5 (50-60 Hz)
Height above tank rim	mm	200	200	200
Depth below tank rim	mm	135	135	135

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		

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

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

Note: when ordering a VTP pump, please specify which refrigeration base unit it is to be used with