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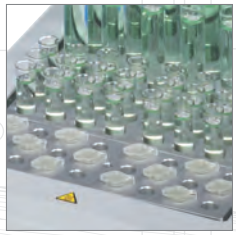
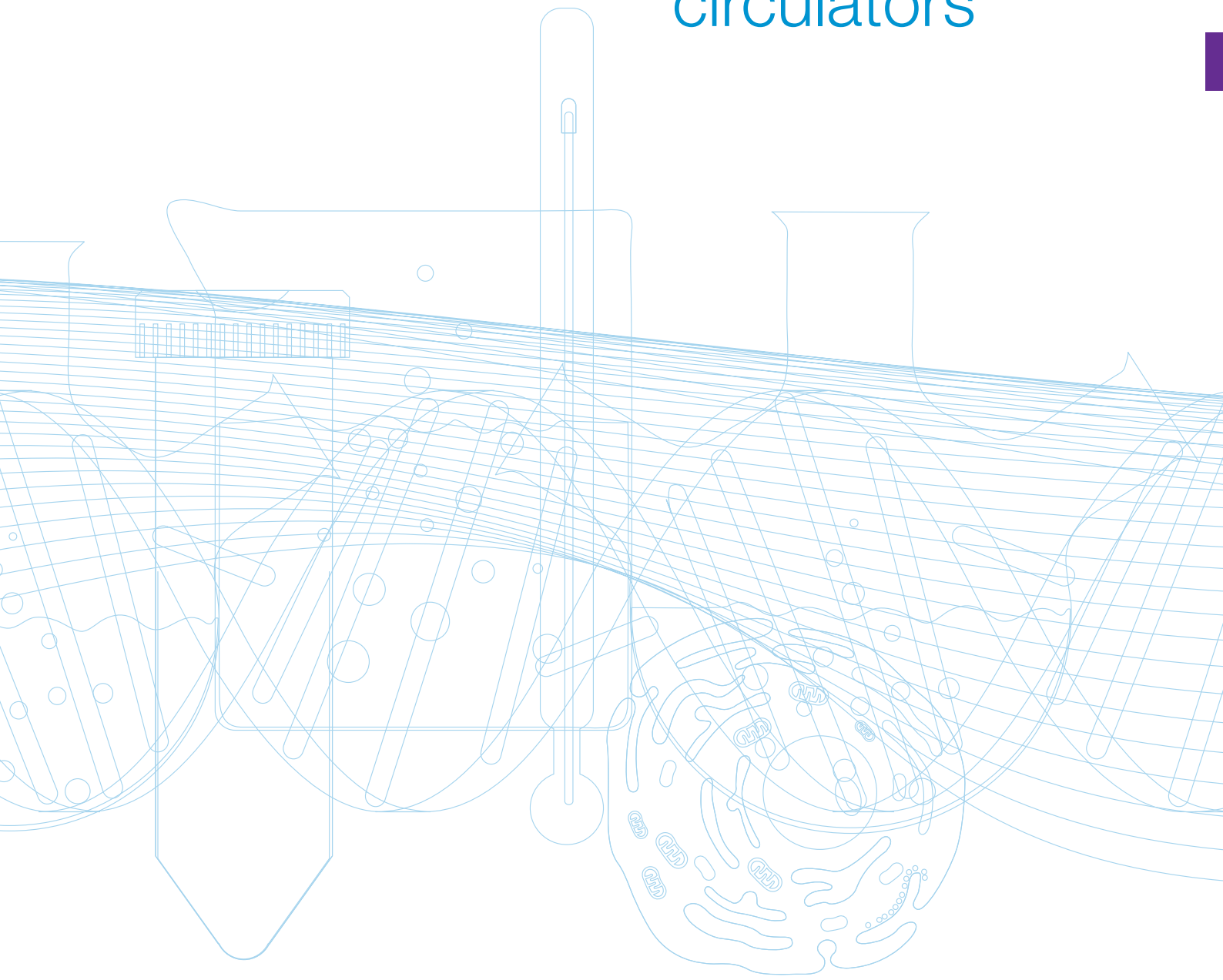
Precision temperature control, sample preparation and life sciences products for the world's laboratories




QUALITY DESIGN « » CONSISTENT PERFORMANCE « » SOUND INVESTMENT

6 Stirred thermostatic baths and circulators



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. All models from the GD120 upwards are suitable for use as both open and closed loop circulators (i.e. remote vessel open or closed).

Alternatively, the Grant FH series of flow heaters (closed circulators) can be used. See p. 17.7 or contact Grant for advice.

For more powerful heating requirements, e.g. i.e. above + 200°C, see Grant high temperature baths (p. 17.5) or contact Grant for advice.

For more details of Grant Optima™ thermostats see, p. 6.6.

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.

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showcase 1 – **entry level** example

Model GD100-S5* range 0 to 100°C, stability ± 0.02°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 (GD100) for precise temperature control**
- **Cooling/heating range 0 to 100°C****
- **Stability ± 0.02°C**
- **5 litre tank volume (other tank sizes available)**
- **Range of convenient programming features**

** operation below ambient temperature requires accessory cooling

Visual alarm – alerts you when your attention is required

Simple-to-use rotor plus two keys provide access to the interactive interface for fast, accurate set-up

User calibration facility for optimum accuracy at the required operating temperature

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

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

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

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

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

Convenient recessed handholds for carrying/ repositioning the unit

Choice of **230 V and 115 V models**

* see summary table on pp. 6.6–6.7 for accessories and for other models utilising the GD100 thermostat

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showcase 2 – **mid range** example

Model GD120-S12* range 0 to 120°C, stability ± 0.02°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 (GD120) for precise temperature control**
- **Integral pump**
- **Cooling/heating range 0 to 120°C****
- **Stability ± 0.02°C**
- **12 litre tank volume (other tank sizes available)**
- **Range of convenient programming features**

** **operation below ambient temperature requires accessory cooling**

Audible and visual alarms – alert you when your attention is required

Simple-to-use rotor plus two keys provide access to the interactive interface for fast, accurate set-up

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

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

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

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

Optional removable hinged gabled lid with insulated handle – minimises evaporation of fluid and avoids contamination of samples

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

Convenient recessed handholds for carrying/ repositioning the unit

Choice of **230 V and 115 V models**

* see summary table on pp. 6.6–6.7 for accessories and for other models utilising the GD120 thermostat

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showcase 3 – **high specification** example

Model GP200-S26* range 0 to 200°C, stability ± 0.005°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 (GP200) for ultra precise temperature control**
- **Stability ± 0.005°C**
- **Cooling/heating range 0 to 200°C****
- **26 litre tank volume (other tank sizes available)**
- **Comprehensive range of sophisticated and automated programming and control functions**

** operation below ambient temperature requires accessory cooling

High performance GP200 digital thermostat

Memory capacity for 5 programs of 30 segments

Convenient heater timer for early morning start-ups/late evening shut-downs

Automatic adjustment of temperature range and heater power according to liquid type selected

Two programmable relays for control of refrigeration on/off or other ancillary equipment

High and low temperature alarm settings – can be configured to switch a relay

High power integral pump with multi-stage variable flow rate – programmable fluid circulation to external devices

Socket for optional external probe – allows remote temperature control

Fast and intuitive menu-driven programming through powerful front-panel interface

Option of Labwise™ PC software for program set-up, data-logging and real-time graphing

High power heater for faster heat-up

* see summary table on p. 6.6–6.7 for accessories and other models utilising the Grant high performance digital control units

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showcase 4 – **budget** example

Model GD100-P12* range ambient + 5 to 99°C, stability ± 0.1°C

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

- **Optima™ digital thermostat (GD100) for accurate temperature control**
- **Cooling/heating range ambient + 5 to 99°C**
- **Designed for use with water**
- **Stability ± 0.1°C**
- **12 litre tank volume**
- **Simple operation**

Choice of **230 V and 115 V models**

Visual alarm – alerts you when your attention is required

Simple-to-use rotor plus two keys provide access to the interactive interface for fast, accurate set-up

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

Float switch – monitors water level and protects from drying 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

Convenient recessed handholds for carrying/repositioning the unit

* see summary table on p. 6.6 for accessories and for other models utilising GD100 control units and/or plastic tanks

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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
- timer
- pump
- offset adjustment
- program storage
- relay
- audible alarm
- menu system
- RS232
- adjustable overtemperature cutout
- visual alarm
- 2 point recalibration
- external probe
- programmable

Thermostatic control units

	Digital		Digital High Performance	
	GD100	GD120	GR150	GP200
	 h: 315 mm d: 145 mm w: 115 mm	 h: 315 mm d: 145 mm w: 115 mm	 h: 315 mm d: 145 mm w: 115 mm	 h: 315 mm d: 145 mm w: 115 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)			
S5 – 5 L stainless steel  h: 175 mm d: 325 mm w: 175 mm	• 150 x 150 mm • 80/140 mm • 300 x 150 x 150 mm • 325 x 175 x 355 mm	GD100–S5 (showcased on page 6.2)	GD120–S5	GR150–S5	GP200–S5
S12 – 12 L stainless steel  h: 175 mm d: 350 mm w: 325 mm	• 210 x 300 mm • 80/140 mm • 325 x 300 x 150 mm • 350 x 325 x 355 mm	GD100–S12	GD120–S12 (showcased on page 6.3)	GR150–S12	GP200–S12
S18 – 18 L stainless steel  h: 225 mm d: 530 mm w: 325 mm	• 390 x 300 mm • 70/130 mm • 505 x 300 x 150 mm • 530 x 325 x 405 mm	GD100–S18	GD120–S18	GR150–S18	GP200–S18
S26 – 26 L stainless steel  h: 225 mm d: 530 mm w: 325 mm	• 390 x 300 mm • 120/180 mm • 505 x 300 x 200 mm • 530 x 325 x 405 mm	GD100–S26	GD120–S26	GR150–S26	GP200–S26 (showcased on page 6.4)
S38 – 38 L stainless steel  h: 225 mm d: 730 mm w: 325 mm	• 580 x 300 mm • 120/180 mm • 690 x 300 x 200 mm • 720 x 325 x 405 mm	GD100–S38	GD120–S38	GR150–S38	GP200–S38
P5 – 5 L plastic  h: 180 mm d: 240 mm w: 330 mm	• 120 x 150 mm • 80/140 mm • 240 x 160 x 150 mm • 390 x 200 x 360 mm	GD100–P5	GD120–P5	GR150–P5	GP200–P5
P12 – 12 L plastic  h: 180 mm d: 415 mm w: 350 mm	• 210 x 280 mm • 80/140 mm • 325 x 280 x 150 mm • 415 x 350 x 360 mm	GD100-P12 (showcased on page 6.5)	GD120–P12	GR150–P12	GP200–P12
P18 – 18 L plastic  h: 180 mm d: 600 mm w: 365 mm	• 280 x 325 mm • 80/140 mm • 510 x 290 x 150 mm • 600 x 350 x 360 mm	GD100–P18	GD120–P18	GR150–P18	GP200–P18

Options and accessories

Labwise™ PC software (optional)					
Allows two-way communication for status display, programming and data capture (see p. 15.1 for more information)		–	–		
External probes (optional)					
for monitoring and controlling temperature of remote loads **FF17** flexible nylon probe, 2 m cable	100 mm x Ø 4.5 mm	–	–		
LL17 stainless steel probe, 2 m cable	125 mm x Ø 5 mm	–	–		
Remote switching device (optional)					
For switching mains powered appliances on and off (up to max. 8 Amps)		–	–	1	2
Vertical turbine pumps (optional)*					
Low noise, compact design. Supplied with pipe connections and special lid for fitting to tank, pipe bore 12.7 mm			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 2 max. pressure	1650 mbar				
max. flow	12 L/min				

* when pump is fitted, available working area is reduced

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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)	**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**** to allow systems to operate at or below room 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)
FG5 flat stainless steel	**1 x PS20**	**1 x QR**	–		–	
LG12 gabled, hinged (removable) stainless steel	**1 x PS20**	**2 x VR**	**RS14**		–	
LG26 gabled, hinged (removable) stainless steel	**2 x PS20**	**4 x VR**	**RS22**		–	
LG26 gabled, hinged (removable) stainless steel	**2 x PS20**	**4 x VR**	**RS28**			
LG38 gabled, hinged (removable) stainless steel	**3 x PS20**	**6 x VR**	**RS28** or **RS38**			
PL5 flat, stainless steel	**1 x PS20**	**1 x QR**	–	–	–	–
PL12 curved plastic	**1 x PS20**	**2 x VR**	**RS14**	–	–	–
PL18 curved plastic	**2 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. Above 100°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 S5 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

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Stirred thermostatic baths and circulators – technical specifications

Grant Optima™ thermostats

● = standard

			Digital		Digital High Performance	
			GD100	GD120	GR150	GP200
						
Stability (DIN 58966), stainless steel (S) tanks	@ 37°C	°C	± 0.02	± 0.02	± 0.005	± 0.005
Uniformity (DIN 58966), stainless steel (S) tanks	@ 37°C	°C	± 0.05	± 0.05	± 0.02	± 0.02
Setting resolution		°C	0.1	0.1	0.1 (0.01 with Labwise)	
Display			4 digit 13 mm LED		4 digit 13 mm LED 2 line 16 character LCD	
Display resolution		°C	0.1	0.1	0.01 (LCD)	0.01 (LCD)
Timer function			–	1 to 9999 mins	1 min to 99 hrs 59 mins	
No. stored temperature values			4	4	4	4
Two point re-calibration			●	●	●	●
Offset adjustment			–	–	●	●
Socket for external probe (Pt1000)			–	–	●	●
RS232 interface			–	–	●	●
Programmable			–	–	remote via PC	remote via PC/direct
No. stored programs			–	–	1 x 30 segment	5 x 30 segment
Relays			–	–	1	2
Safety	overtemperature		–	adjustable cut-out		
	fluid level – float switch		●	●	●	●
Alarms (can be configured to switch a relay)			–	high	high and low	high and low
Heater power	240 V	kW	1.4	1.4	2	2
	115 V	kW	1.3	1.3	1.3	1.3
Electrical power	220-240 V	kW	1.5 (50-60 Hz)	1.5 (50 Hz)	2.2 (50 Hz)	2.2 (50-60 Hz)
	110-120 V	kW	1.4 (50-60 Hz)	1.4 (60 Hz)	1.4 (60 Hz)	1.4 (50-60 Hz)
Height above tank rim		mm	180	180	180	180
Depth below tank rim		mm	135	135	135	135

Grant Optima™ thermostat pumps (integral)

Maximum pressure	water	mbar		310	310	530
Maximum flow	water	L/min		17	17	21 (adjusted 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 (K 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, 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.

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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
Mains power 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

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		VA	300	500	–
Dimensions	d/w/h	mm	460/305/225	460/305/225	–
Flexible pipe	l	mm	925	925	–
Coil	Ø /l	mm	77/55	77/55	77/55
Pipe bore inlet/outlet		mm	–	–	7
Electrical supply			220-240 V (50 Hz)	220-240 V (50 Hz)	–

* 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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