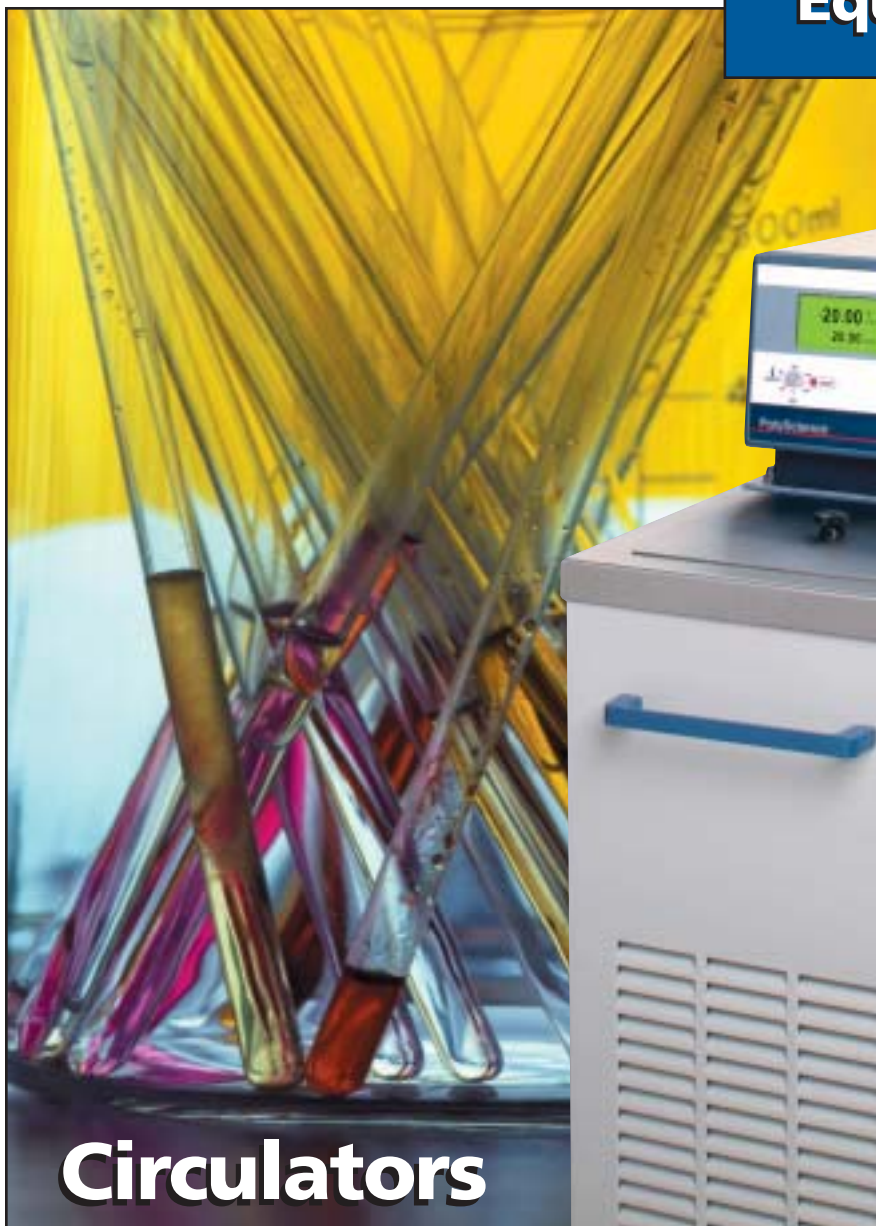


**Constant
Temperature
Equipment**



The Benefits of

PolyScience



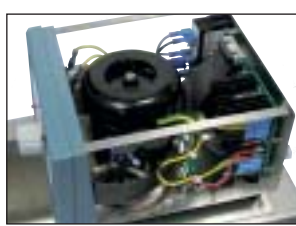
PolyScience is a leading manufacturer of Refrigerated Circulators, Heating Circulators, Chillers, Heat Exchangers, Water Baths, and custom temperature control equipment for industrial and laboratory use. We have been providing customers worldwide with precision temperature control equipment since 1963 and serve a diverse range of industries, including:

- Biotechnology
- Chemical
- Industrial Laser
- Medical
- Pharmaceutical
- Clinical

Beyond our comprehensive line of standard temperature control products, PolyScience also offers custom designed heating and cooling equipment. If you have a special application or specific product need, our experienced design, engineering, and technical staff will be happy to review your application and design a product that meets your exact requirements.



ISO 9001:2000 Certified



Precise Control

Controllers to fit every need - from precise programmable models to simple analog control for less demanding applications.



Easy Set-Up

Programmable and Digital controllers feature multi-language help menus to simplify operation and set-up.



Prevent Condensation

A reservoir purge tube port allows the injection of inert gas into the bath's reservoir to prevent condensation build-up.

Refrigerating/Heating Circulating Baths

Heating Circulating Baths

Immersion Circulators

Coolers



Cool Command Refrigeration Technology

- Rapid Cool Downs at Elevated Temperatures
- Ultra-Precise Cooling Control
- Longer Compressor Life

Cool Command is an advanced refrigeration technology that carefully monitors heat load to deliver only the amount of refrigerant needed. As a result, it permits fast bath cooling even at high temperatures without excessive energy consumption.

PolyScience Circulators



Selectable Flow Rates

Pressure and suction pumps on programmable and digital models provide selectable flow rates for both open and closed applications.



Exceptional Stability

Advanced refrigeration systems and high wattage heaters respond quickly to temperature changes for ultimate stability.



Lasting Durability

Stainless steel wetted parts and reservoirs fight corrosion. Tough epoxy powder coated exteriors clean easily.

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PolyScience Controllers Programmable Controller

Programmable Controller

- Time/Temperature Programming and Data Logging
- Full Graphic Display with Multi-Language Help Menus
- 200°C Temperature Control
- Optional Remote Probe Capability
- RS232 Interface
- 5-Speed Pump Control
- Compatible with National Instruments LabView™, Microsoft® Excel, and Palm OS®
- Easy-to-Use Select/Set Knob
- Readout in °C or °F



The Programmable Controller

The PolyScience Programmable Controller offers the greatest number of features plus the simplicity of a one-touch, multi-function, Select/Set knob.

The multi-language LCD graphic readout simultaneously displays your set point and actual fluid temperature. The built-in timer provides visual and audible indications of timed events. The display also lets you know when it's time for calibration or service to insure accuracy and eliminate downtime.

Time/temperature programs can be set directly by the controller's Select/Set knob. Ten programs can be stored in the controller's memory, each having up to 50 steps that can be cycled up to 999 times.

An RS232 interface is standard. Data logging can be viewed from the graphic display or via your PC. Included software supports National Instruments LabView™, Microsoft® Excel, and Palm® OS.

Remote probe capability is one of the strongest reasons for choosing the Programmable Controller. The optional probe can take over temperature control at the point of application, such as in a remote bath. Temperature shifts due to heat loss along tubing lines are eliminated and accuracy is maintained.

Programmable units are accurate to $\pm 0.25^{\circ}\text{C}$, and stable to $\pm 0.01^{\circ}\text{C}$. The micro-processor controller can be tuned to optimize PID performance for various fluids and volumes. User-adjustable high and low temperature limits and alarms are stored in non-volatile memory. A redundant safety thermostat protects over-temperature and low-liquid situations. On-demand automatic refrigeration control is standard on all refrigerated programmable units.

The programmable unit can be used for open or closed loop applications with its 5-speed pressure/suction (duplex) pump.



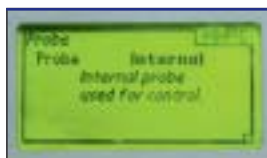
Set preference parameters with multi-language help menus.



Time/temperature programming by PC or by the controller's Select/Set knob.



Temperature trends on the controller's display with real-time graphing.



Select internal probe or external probe to optimize control.



Set high and low limits with ease. Audible alarm capability.

PolyScience Controllers

Digital, Standard, and Analog



- Full Graphic Display with Multi-Language Help Menus
- 200°C Temperature Control
- RS232 Interface
- Microprocessor Control
- Readout in °C and °F



- Three User-defined Temperature Preset Buttons
- 150°C Temperature Control
- Easy-to-Read LED Display
- Accurate Microprocessor Control
- Excellent Performance - Moderate Price



- Proportional Temperature Control
- 100°C Temperature Control
- Great for Routine Use
- Redundant Safety Backup
- Most Economical Model

Digital Controller

The PolyScience Digital Controller provides outstanding performance for demanding applications where programmability, software bundle, or remote probe are not required.

Readout accuracy is $\pm 0.25^{\circ}\text{C}$, stability is $\pm 0.01^{\circ}\text{C}$, and temperature control is up to 200°C . The LCD provides convenient menu selection and displays set and actual fluid temperatures simultaneously.

The powerful microprocessor controller can be tuned to optimize PID performance for various fluids and volumes. In addition to user-settable high and low safety limits, redundant over-temperature and low-liquid level cutoffs are standard.

Equipped with a 5-speed pressure/suction (duplex) pump, the Digital Controller may be used for either open or closed loop applications.

Standard Controller

Digital set and read to 0.1°C and microprocessor control at a price near analog technology distinguish the PolyScience Standard Controller. Its stability of $\pm 0.05^{\circ}\text{C}$ plus temperature control up to 150°C are excellent for many applications.

Operation is simple: One Select/Set knob and three temperature preset buttons. The bright LED displays fluid temperature continuously, and with a quick touch of the Select/Set knob, displays your set temperature. Choosing $^{\circ}\text{C}$ or $^{\circ}\text{F}$ temperature units, entering calibration values, and setting high limit temperature are quick and easy.

All Standard Controllers have a 2-speed pressure (simplex) pump suitable for closed loop applications. Low pump speed is quiet and provides longer motor life, high speed is preferable for more difficult pumping requirements.

A redundant safety backup for over-temperature and low-liquid situations protects your work and equipment.

Analog Controller

The PolyScience Analog Controller is used on selected models. It provides economical and accurate control with $\pm 0.2^{\circ}\text{C}$ stability and temperature control up to 100°C .

Special controller design eliminates annoying radio frequency electrical interference which can disrupt nearby lab equipment.

The 2-speed pressure (simplex) pump produces a flow of 9 or 15 liters per minute on most models. Temperature readout is via a supplied thermometer (non-mercury).

**PolyScience
Controllers**

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Refrigerating/Heating Circulators

The 9100 Series

9100 Series Features

- Most Popular Design
- Small Footprint - Less Than 1 sq.ft.
- 6 Liter Reservoir
- Choice Of Four Controllers
- Enhanced Cooling Capacity
- Quiet Operation
- Easy-Access Reuseable Filter

This series features a 6 liter reservoir in a space-saving vertical design. Only 8¼ in. (21cm) wide, the small footprint conserves precious bench space.

Size, performance, and a choice of four controllers combine to make this series PolyScience's most popular circulators.

Dependable, precise, and compact, all models feature redundant over-temperature and low-liquid level protection.

The refrigeration system is designed to be used below 70°C. This allows rapid bath cooling from 70°C or lower, while maximizing temperature control and reducing energy consumption above 70°C. The hermetically-sealed compressor is designed for years of maintenance-free use.



Programmable Model 9112. This top-of-the-line model features a wide temperature range and time/temperature programmability. Programs can be set directly from the front panel with the aid of the Select/Set knob and multi-language display or from a PC using the RS232 interface. LabView™ drivers and Excel® macros offer even greater programming and data logging convenience. Remote probe capability plus 5-speed pressure/suction (duplex) pump further enhance the 9112's capabilities.

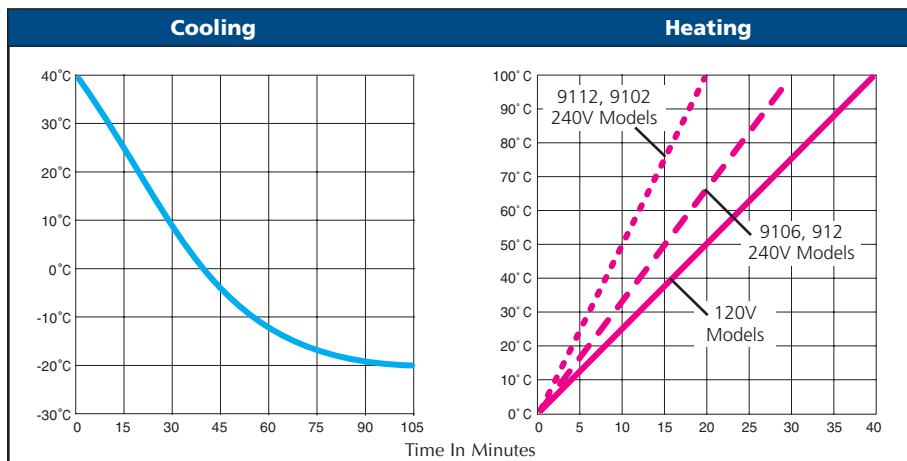
Digital Model 9102. The Digital Controller offers the same advanced performance as the programmable model and is the ideal choice when remote probe, time/temperature programming, or communication software are not required. The LCD display also incorporates multi-language help menus that aid set-up and operation when using the Select/Set knob. A built-in RS232 interface is standard. The 5-speed pressure/suction pump can be used in both open and closed loop applications. Great performance for those on a budget.

Standard Model 9106. With the same cooling capacity as our more full featured models, this model combines high performance with economy. It is equipped with three user-defined temperature preset buttons for rapid set point changes. The bright LED display provides read and set capability, and its ±0.05°C stability meets all but the most demanding requirements. Frequently used for cooling electrophoresis cells, viscometers, and general lab applications.

Analog Model 912. Ideal for routine applications where extreme accuracy and stability are not critical. An excellent, low-price alternative to tap water cooling for rotary evaporators and condensers. Convenient set-point dial with supplied thermometer (alcohol) readout.

See pages 4 and 5 for additional controller information.

Upright, Space-Saving Design 6 Liter



9100 Series Applications

- Calibration
- Chromatography Columns
- Densitometers
- Distillation Condensers
- Electrophoresis Apparatus
- General Laboratory Cooling
- Isoelectric Focusing
- Polarimeters
- Refractometers
- Rotary Evaporators
- Spectrophotometers
- Viscometers

Accessories on pages 30 and 31.

Programmable Model Accessories:

- Remote Probe:
 - 10 ft. - 060101
 - 25 ft. - 060105
 - 50 ft. - 060110

-Digital to Analog Adapter: 060120

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9100 Series Specifications	
Reservoir Capacity	6 liters
Cooling Capacity @	+20°C 200 Watts
	0°C 140 Watts
	-10°C 100 Watts
Over-Temperature Cutoff	Adjustable
Low-Liquid Cutoff	Yes
Working Access l x w x d	5 1/4 x 5 1/4 x 5 1/2 in. 13.3 x 13.3 x 14 cm
Overall Dimensions l x w x h	15 3/4 x 8 1/4 x 22 1/2 in. 40 x 21 x 57.1 cm
Pump Inlet and Outlet	1/4 in. FPT Rear Discharge

Note: For Cooling Capacity (Watts x 3.41) = BTU/hr.

---Tech Tip---

Fluids For Below Ambient Work

- ✓ Select one that satisfies operating conditions, including safety, flash point, and freezing point.
- ✓ Pick the lowest possible viscosity.
- ✓ Avoid synthetic fluids that are hygroscopic to prevent ice from forming in the reservoir.
- ✓ Minimize use of mixtures that may change concentration due to evaporation.
- ✓ Some mixtures may change from non-flammable to flammable if a volatile component is randomly added to keep the freezing point depressed.

Specifications	Model 9112	Model 9102	Model 9106	Model 912
Temperature Range	-20° to 200°C	-20° to 200°C	-20° to 150°C	-20° to 100°C
Temperature Stability	± 0.01°C	± 0.01°C	± 0.05°C	± 0.2°C
Controller / RS232	Programmable / Yes	Digital / Yes	Standard / No	Analog / No
Readout	Graphic LCD	Graphic LCD	LED	Thermometer (supplied)
Temperature Readout	°C or °F	°C or °F	°C or °F	N/A
Readout Accuracy	± 0.25°C	± 0.25°C	± 0.5°C	N/A
Pressure Flow Rate	5-speed, 12 to 25 lpm	5-speed, 12 to 25 lpm	2-speed, 9 or 15 lpm	2-speed, 9 or 15 lpm
Suction Flow Rate	5-speed, 8 to 18 lpm	5-speed, 8 to 18 lpm	N/A	N/A
Heater	60Hz 1100 Watts 50Hz 2200 Watts	1100 Watts 2200 Watts	1100 Watts 1600 Watts	1100 Watts 1600 Watts
Shipping Weight	70 lbs / 32 kg	70 lbs / 32 kg	64 lbs / 29 kg	64 lbs / 29 kg
Cat. No. 120V, 60Hz, 12A	072594	072590	072531	072510
Cat. No. 240V, 50Hz, 9.9A	072596	072592	072535	072515

Note: Performance specifications determined at ambient temperature of 20°C/68°F. For 50Hz units, derate cooling capacity by 17%.

Refrigerated/Heating Circulators

The 9000 Series

9000 Series Features

- Low Profile Permits Convenient Shelf or Bench Top Placement
- Bath Top Work Space
- 6 Liter Reservoir
- Easy Access Sample Immersion
- Ideal for Use On Mobile Carts
- Easy-Access Reusable Filter

PolyScience 9000 Series Circulators combine exceptional performance with a low profile design that permits placement on shelves, bench tops, even mobile carts without sacrificing capabilities or convenience. Each 9000 model features the same temperature range, cooling capacity, and pump as its 9100 Series' counterpart while also providing almost a full square foot of additional work space on its stainless steel top.

In applications where bench space is at a premium, 9000 Series Circulators can be placed on a shelf above the work area while still providing convenient eye-level access to the controls. And their wide footprint adds stability for calibration work or applications where cart-mounted use is desirable.



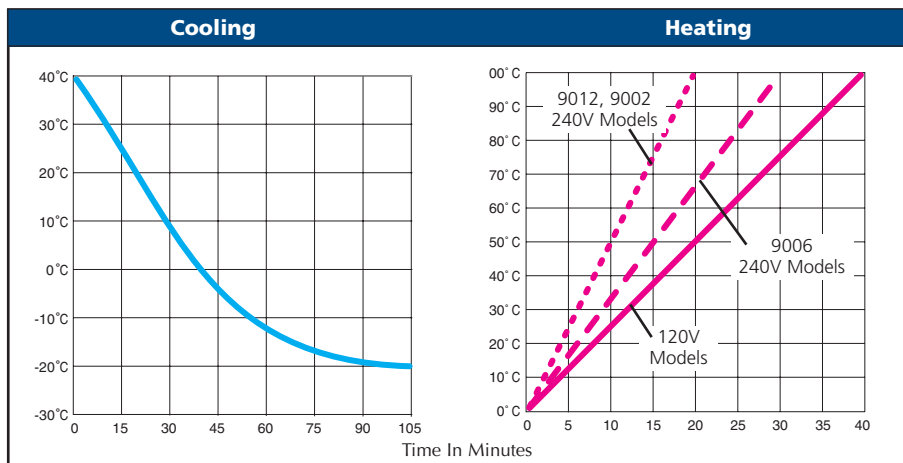
Programmable Model 9012. This model features a -20°C to 200°C temperature range and time/temperature programmability. The full graphic display with multi-language help menus and Select/Set knob make operation and set-up quick and simple. Data logging via the RS232 interface and included software are also possible. LabView™ drivers and Excel® macros provide even greater programming and data logging convenience. Remote probe capability and 5-speed pressure/suction (duplex) pump are standard.

Digital Model 9002. Excellent temperature range and stability, combined with the easy-reading, full graphic display and multi-language help menus, make this model suitable for many applications and budgets. The built-in RS232 port comes standard. The pump is a 5-speed pressure/suction (duplex) type for open or closed loop applications.

Standard Model 9006. Designed for routine use up to 150°C, this model economically delivers the same cooling as our Programmable and Digital models. The convenient read-and-set LED display plus stability of $\pm 0.05^\circ\text{C}$ meets most requirements. Three user-defined temperature buttons offer quick set point changes for frequently used applications. The pump is 2-speed pressure (simplex) type for closed loop applications.

See pages 4 and 5 for additional controller information.

Low Profile Design 6 Liter



9000 Series Specifications	
Reservoir Capacity	6 liters
Cooling Capacity @	+20°C 200 Watts
	0°C 140 Watts
	-10°C 100 Watts
Over-Temperature Cutoff	Adjustable
Low-Liquid Cutoff	Yes
Working Access l x w x d	5 1/4 x 5 1/4 x 5 1/2 in.
	13.3 x 13.3 x 14 cm
Overall Dimensions l x w x h	15 3/4 x 18 3/4 x 17 in.
	40 x 47.6 x 43.2 cm
Pump Inlet and Outlet	1/4 in. FPT Rear Discharge

Note: For Cooling Capacity (Watts x 3.41) = BTU/hr.

---Tech Tip---

- ✓ For optimum performance locate your circulator on a level surface free from drafts and direct sunlight.
- ✓ Avoid locations where corrosive fumes, excessive moisture, or excessive dust are present.
- ✓ Protect against voltage drops by using properly grounded power outlets wired with 14 gauge or larger diameter wire. Locate the circulator close to the power outlet.

Specifications	Model 9012	Model 9002	Model 9006
Temperature Range	-20° to 200°C	-20° to 200°C	-20° to 150°C
Temperature Stability	±.01°C	±.01°C	±.05°C
Controller / RS232	Programmable / Yes	Digital / Yes	Standard / No
Readout	Graphic LCD	Graphic LCD	LED
Temperature Readout	°C or °F	°C or °F	°C or °F
Readout Accuracy	± 0.25°C	± 0.25°C	± 0.5°C
Pressure Flow Rate	5-speed, 12 to 25 lpm	5-speed, 12 to 25 lpm	2-speed, 9 or 15 lpm
Suction Flow Rate	5-speed, 8 to 18 lpm	5-speed, 8 to 18 lpm	N/A
Heater	60Hz 1100 Watts	1100 Watts	1100 Watts
	50Hz 2200 Watts	2200 Watts	1600 Watts
Shipping Weight	78 lbs / 35.5 kg	78 lbs / 35.5 kg	67 lbs / 30.5 kg
Cat. No. 120V, 60Hz, 12A	072506	072502	072503
Cat. No. 240V, 50Hz, 9.9A	072508	072504	072505

Note: Performance specifications determined at ambient temperature of 20°C/68°F. For 50Hz units, derate cooling capacity by 17%.

9000 Series Applications

- Calibration
- Chromatography Columns
- Densitometers
- Distillation Condensers
- Electrophoresis Apparatus
- General Laboratory Cooling
- Isoelectric Focusing
- Polarimeters
- Refractometers
- Rotary Evaporators
- Spectrophotometers
- Viscometers

Accessories
On pages 30 and 31.

Programmable Model
Accessories:

- Remote Probe:
10 ft. - 060101
25 ft. - 060105
50 ft. - 060110

-Digital to Analog
Adapter: 060120

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Refrigerating/Heating Circulators

The 9500 Series

9500 Series Features

- -30°C Cooling Capability
- 13 Liter Reservoir
- Energy-Saving Cool Command™ Refrigeration System
- Large Reservoir, Large Opening
- Easy-Access Reusable Filter

PolyScience 9500 Series Circulators offer exceptional cooling capability over a broad temperature range plus a high-capacity, easy-to-access 13 liter reservoir.

These versatile circulators also feature our exclusive Cool Command refrigeration system and fuzzy logic energy management technique to deliver up to 50% greater energy efficiency than traditional systems. This advanced technology carefully monitors heat load to deliver only the amount of refrigerant needed. As a result, it permits fast bath cooling even at high temperatures without excessive energy consumption.

To further add to their application versatility, Models 9512 and 9502 feature a powerful 5-speed pressure/suction (duplex) pump, making them ideal for use where continuous, low-temperature operation is required or where the viscosity of the liquid may affect circulation uniformity.



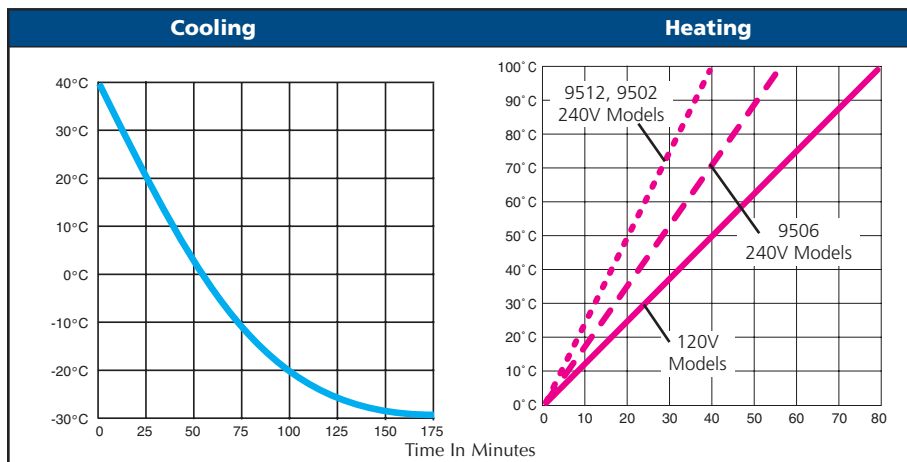
Programmable Model 9512. The Programmable Controller offers a wide temperature range, exceptional stability, and 5-speed pressure/suction (duplex) pump along with time/temperature programming and remote probe capability. RS232 interface and PC programming software are standard. LabView™ drivers and Excel® macros provide even greater programming and data logging convenience. The full graphic LCD display and multi-language help menus simplify operation and set-up.

Digital Model 9502. Excellent temperature range and stability combined with an easy-reading graphic display make this model a fine choice for many applications. The pump is a powerful 5-speed pressure/suction (duplex) type for open or closed loop applications. A built-in RS232 interface comes standard. The full graphic LCD display and multi-language help menus simplify operation and set-up.

Standard Model 9506. The same -30°C cooling capacity of our Programmable and Digital models at a price comparable to units with analog controllers make the Model 9506 a great value for applications where high heat removal at close to ambient temperature is required. Microprocessor-based controller provides set-and-read functionality; three user-defined temperature buttons make set point changes quick and easy. The 2-speed pressure (simplex) pump is suitable for closed loop applications.

See pages 4 and 5 for additional controller information.

Low Temperature Control 13 Liter



9500 Series Applications

- Low Temperature Calibration
- Cloud Point and Pour Point Testing
- Cell Freezing
- Low Temperature Reactions
- Distillation Condensers
- General Laboratory Cooling
- Rotary Evaporators
- Spectrophotometers
- Viscosity Studies

9500 Series Specifications	
Reservoir Capacity	13 liters
Cooling Capacity @	+20°C 660 Watts
	0°C 480 Watts
	-20°C 240 Watts
	-30°C 100 Watts
Over-Temperature Cutoff	Adjustable
Low-Liquid Cutoff	Yes
Reservoir Drain	Yes
Working Access l x w x d	6 x 11 x 5 1/2 in. 14 x 28 x 15.2 cm
Overall Dimensions l x w x h	17 x 15 1/2 x 24 3/4 in. 43 x 39.4 x 62.9 cm
Pump Inlet and Outlet	1/4 in. FPT Rear Discharge

Note: For Cooling Capacity (Watts x 3.41) = BTU/hr.

---Tech Tip---

For Best Temperature Control

- ✓ Use the largest diameter tubing possible for maximum flow.
- ✓ Insulate the tubing between the circulator and the application.
- ✓ Choose a fluid with lowest viscosity at the selected operating temperature.
- ✓ Select pump speed for optimum fluid mixing. This helps assure good uniformity.
- ✓ Keep reservoir covered.
- ✓ Consider the use of a remote probe.

Accessories on pages 30 and 31.

Programmable Model Accessories:

- Remote Probe:
10 ft. - 060101
25 ft. - 060105
50 ft. - 060110

-Digital to Analog Adapter: 060120

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Specifications	Model 9512	Model 9502	Model 9506
Temperature Range	-30° to 200°C	-30° to 200°C	-30° to 150°C
Temperature Stability	± 0.01°C	± 0.01°C	± 0.05°C
Controller / RS232	Programmable / Yes	Digital / Yes	Standard / No
Readout	Graphic LCD	Graphic LCD	LED
Temperature Readout	°C or °F	°C or °F	°C or °F
Readout Accuracy	± 0.25°C	± 0.25°C	± 0.5°C
Pressure Flow Rate	5-speed, 12 to 25 lpm	5-speed, 12 to 25 lpm	2-speed, 9 or 15 lpm
Suction Flow Rate	5-speed, 8 to 18 lpm	5-speed, 8 to 18 lpm	N/A
Heater	60Hz 1100 Watts 50Hz 2200 Watts	1100 Watts 2200 Watts	1100 Watts 1600 Watts
Shipping Weight	139 lbs / 63.2 kg	139 lbs / 63.2 kg	139 lbs / 63.2 kg
Cat. No. 120V, 60Hz, 13A	072660	072650	072537
Cat. No. 240V, 50Hz, 9.8A	072665	072655	072539

Note: Performance specifications determined at ambient temperature of 20°C/68°F. For 50Hz units, derate cooling capacity by 17%.

Refrigerating/Heating Circulators

The 9700 Series

9700 Series Features

- -40°C or lower Cooling Capability
- 13 Liter Reservoir
- Broad Operating Temperature Range
- Ample Reservoir for Sample Immersion
- Cool Command™ Refrigeration System
- Enlarged Access Opening
- Easy-Access Reuseable Filter

Ultra-low cooling capability, large 13 liter reservoir, and integral over-temperature and low-liquid level protection combine to make PolyScience 9700 Series Circulators ideal for a wide range of demanding applications.

Models 9712 and 9702 offer a -45° to 200°C temperature range with $\pm 0.01^\circ\text{C}$ temperature stability. The Model 9705 features a temperature range of -40° to 150°C with $\pm 0.1^\circ\text{C}$ stability. All models feature our Cool Command refrigeration system and fuzzy logic energy management technique to deliver up to 50% greater energy efficiency than traditional systems. This advanced technology carefully monitors heat load to deliver only the amount of refrigerant needed. As a result, it permits fast bath cooling even at high temperatures without excessive energy consumption.



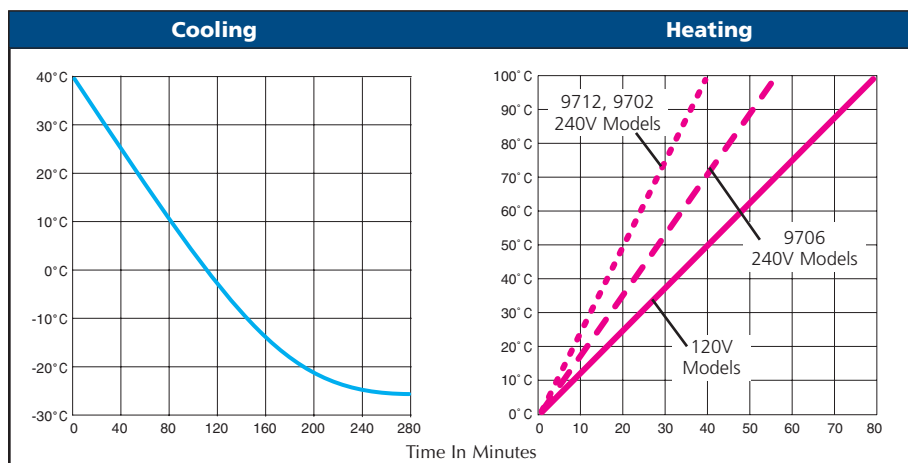
Programmable Model 9712. This model offers the widest temperature range along with high stability and 5-speed pressure/suction (duplex) pump. Additional features include time/temperature programming and remote probe capability. RS232 interface and software for PC programming are standard. LabView™ drivers and Excel® macros offer even greater programming and data logging convenience. The full graphic LCD display with multi-language help menus aid in operation and set-up.

Digital Model 9702. Excellent temperature range and stability combined with easy-reading graphic display make this model a fine choice for many applications and budgets. A built-in RS232 interface comes standard. The pump is a powerful 5-speed pressure/suction (duplex) type for open or closed loop applications. The full graphic LCD display with multi-language help menus simplify operation and set-up.

Standard Model 9706. A -40°C cooling capacity and +150°C upper temperature limit make this circulator an economical choice for applications where high heat removal at close to ambient temperatures is required. Microprocessor-based controller provides set-and-read functionality; three user-defined temperature buttons make set point changes quick and simple. The 2-speed pressure (simplex) pump is suitable for closed loop applications.

See pages 4 and 5 for additional controller information.

Extra Low Temperature Control 13 Liter



9700 Series Specifications	
Reservoir Capacity	13 liters
Cooling Capacity @	+20°C 900 Watts
	0°C 825 Watts
	-30°C 200 Watts
Over-Temperature Cutoff	Adjustable
Low-Liquid Cutoff	Yes
Reservoir Drain	Yes
Working Access l x w x d	6 x 11 x 5½ in. 14 x 28 x 15.2 cm
Overall Dimensions l x w x h	17 x 15½ x 24¾ in. 43 x 39.4 x 62.9 cm
Pump Inlet and Outlet	¼ in. FPT Rear Discharge

Note: For Cooling Capacity (Watts x 3.41) = BTU/hr.

---Tech Tip---

Fluids For Below Ambient Work

- ✓ Select one that satisfies operating conditions, including safety, flash point and freezing point.
- ✓ Pick the lowest possible viscosity.
- ✓ Avoid synthetic fluids that are hygroscopic to prevent ice from forming in the reservoir.
- ✓ Minimize use of mixtures that may change concentration due to evaporation.
- ✓ Some mixtures may change from non-flammable to flammable if a volatile component is randomly added to keep the freezing point depressed.

Specifications	Model 9712	Model 9702	Model 9706
Temperature Range	-45° to 200°C	-45° to 200°C	-40° to 150°C
Temperature Stability	± 0.01°C	± 0.01°C	± 0.1°C
Controller / RS232	Programmable / Yes	Digital / Yes	Standard / No
Readout	Graphic LCD	Graphic LCD	LED
Temperature Readout	°C or °F	°C or °F	°C or °F
Readout Accuracy	± 0.25°C	± 0.25°C	± 0.5°C
Pressure Flow Rate	5-speed, 12 to 25 lpm	5-speed, 12 to 25 lpm	2-speed, 9 or 15 lpm
Suction Flow Rate	5-speed, 8 to 18 lpm	5-speed, 8 to 18 lpm	N/A
Heater	60Hz 1100 Watts 50Hz 2200 Watts	1100 Watts 2200 Watts	1100 Watts 1600 Watts
Shipping Weight	150 lbs / 68.2 kg	150 lbs / 68.2 kg	142 lbs / 64.5 kg
Cat. No. 120V, 60Hz, 14A	072718	072710	072700
Cat. No. 240V, 50Hz, 9.9A	072720	072715	072705

Note: Performance specifications determined at ambient temperature of 20°C/68°F. For 50Hz units, derate cooling capacity by 17%.

9700 Series Applications

Low Temperature Calibration

Cloud Point and Pour Point Testing

Cell Freezing

Low Temperature Reactions

Distillation Condensers

General Laboratory Cooling

Rotary Evaporators

Spectrophotometers

Viscosity Studies

Accessories on pages 30 and 31.

Programmable Model Accessories:

-Remote Probe:
10 ft. - 060101
25 ft. - 060105
50 ft. - 060110

-Digital to Analog Adapter: 060120

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Refrigerating/Heating Circulators

The 9600 Series

9600 Series Features

- -25°C Cooling Capability
- 28 Liter Reservoir Accommodates Large or Multiple Samples
- Extra Large Reservoir Opening
- Energy-Saving Cool Command™ Refrigeration System
- Bath Top Work Space
- Easy-Access Resuable Filter

The 9600 Series combines -25°C cooling capacity with a spacious 28 liter reservoir to provide precise temperature control for large or multiple samples even under rapidly changing heat loads. Plus they feature large 10¼ by 10¼ in. reservoir openings to make immersion and retrieval of samples quick and easy.

All 9600 Series models also feature our Cool Command refrigeration system and fuzzy logic energy management technique to deliver up to 50% greater energy efficiency than traditional systems. This advanced technology carefully monitors heat load to deliver only the amount of refrigerant needed. As a result, it permits fast bath cooling even at high temperatures without excessive energy consumption.



Programmable Model 9612. The most versatile model in the 9600 Series, the 9612 provides precise temperature control from -25°C to +150°C and features time/temperature programming, remote probe capability, and a 5-speed pressure/suction (duplex) pump. An RS232 interface and PC programming software are standard while LabView™ drivers and Excel® macros provide even greater programming and data logging convenience. A full graphic LCD display with multi-language help menus simplify operation and set-up.

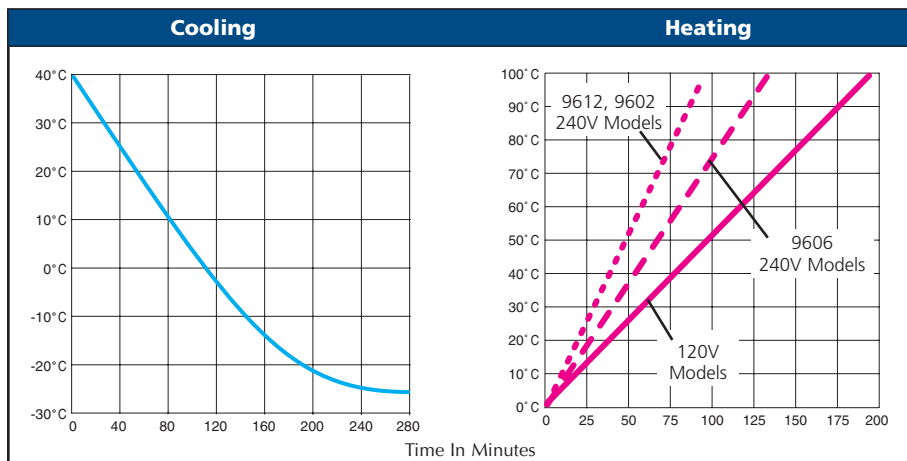
Digital Model 9602. A fine choice for more modest applications and budgets, the 9602 features -25°C to +150°C temperature control, a powerful 5-speed pressure/suction (duplex) pump for open or closed loop applications, and integral RS232 interface. A full graphic LCD display with multi-language help menus simplify operation and set-up.

Standard Model 9606. The most economical model in this series, the 9606 offers the same temperature range and cooling capacity as our more full-featured models. A micro-processor-based controller provides set-and-read functionality; three user-defined temperature buttons make set point changes quick and simple. The 2-speed pressure (simplex) pump is suitable for closed loop applications.

See pages 4 and 5 for additional controller information.

Large Access Reservoir

28 Liter



9600 Series Applications

- Temperature Calibration
- Cloud Point and Pour Point Testing
- Low Temperature Reactions
- Distillation Condensers
- General Laboratory Cooling
- Rotary Evaporators
- Spectrophotometers
- Sample Tempering
- Viscosity Studies

9600 Series Specifications	
Reservoir Capacity	28.4 liters
Cooling Capacity @	+20°C 700 Watts
	0°C 510 Watts
	-20°C 260 Watts
Over-Temperature Cutoff	Adjustable
Low-Liquid Cutoff	Yes
Reservoir Drain	Yes
Working Access l x w x d	10 1/4 x 10 1/4 x 10 1/4 in. 26 x 26 x 26 cm
Overall Dimensions l x w x h	19 1/2 x 27 1/2 x 18 1/2 in. 49.5 x 70 x 47 cm
Pump Inlet and Outlet	1/4 in. FPT Rear Discharge

Note: Cooling capacity, Watts x 3.41 = BTU's/hr.

---Tech Tip---

Selectable Pump Speed Advantages:

- Slow Speed**
 - ✓ Quieter Operation
 - ✓ Longer Motor Life
 - ✓ Minimizes Bath Turbulence
 - ✓ Reduce friction heating of bath
- Faster Speed**
 - ✓ Responds Quickly to Changes
 - ✓ Pumps to Multiple Systems
 - ✓ Better Flow in Small Tubing
 - ✓ Better Uniformity with Viscous Fluids

Accessories on pages 30 and 31.

Programmable Model Accessories:

- Remote Probe:
10 ft. - 060101
25 ft. - 060105
50 ft. - 060110

-Digital to Analog Adapter: 060120

Specifications	Model 9612	Model 9602	Model 9606
Temperature Range	-25° to 150°C	-25° to 150°C	-25° to 150°C
Temperature Stability	± 0.01°C	± 0.01°C	± 0.05°C
Controller / RS232	Programmable / Yes	Digital / Yes	Standard / No
Readout	Graphic LCD	Graphic LCD	LED
Temperature Readout	°C or °F	°C or °F	°C or °F
Readout Accuracy	± 0.25°C	± 0.25°C	± 0.5°C
Pressure Flow Rate	5-speed, 12 to 25 lpm	5-speed, 12 to 25 lpm	2-speed, 9 or 15 lpm
Suction Flow Rate	5-speed, 8 to 18 lpm	5-speed, 8 to 18 lpm	N/A
Heater	60Hz 1100 Watts 50Hz 2200 Watts	1100 Watts 2200 Watts	1100 Watts 1600 Watts
Shipping Weight	162 lbs / 73.6 kg	162 lbs / 73.6 kg	162 lbs / 73.6 kg
Cat. No. 120V, 60Hz, 13A	072690	072680	072671
Cat. No. 240V, 50Hz, 9.8A	072695	072685	072676

Note: Performance specifications determined at ambient temperature of 20°C/68°F. For 50Hz units, derate cooling capacity by 17%.

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Heating Circulators

The 8000 Series

8000 Series Features

- Above Ambient Temperature Control
- 6 Liter
- Small Footprint, Low Profile
- Choice of Microprocessor or Analog Controller

Compact and powerful, PolyScience 8000 Series Circulators are ideal for precise control of temperature from 5°C above ambient to as high as 200°C. Four different controllers are available – from a full-featured, fully programmable controller to a low-cost, set-it-and-forget-it analog model.

For even greater operational flexibility, a variety accessories and add-ons are also available for 8000 Series Circulators. Our Model 20 Ambient Bath Cooler (page 21) and tap water cooling coil (Cat. No. 060300; page 30) allow operation at temperatures closer to ambient and provide more rapid cool-down from elevated temperatures. And for below ambient work, one of our KR Flow-Through Coolers (page 28) can be added to provide cooling down to -35°C or lower.



Programmable Model 8012. The most versatile model in the 8000 Series, the 8012 provides precise temperature control from 5°C above ambient to 200°C and features time/temperature programming, remote probe capability, and a 5-speed pressure/suction (duplex) pump. An RS232 interface and PC programming software are standard while LabView™ drivers and Excel® macros provide even greater programming and data logging convenience. A full graphic LCD display and multi-language help menus simplify operation and set-up.

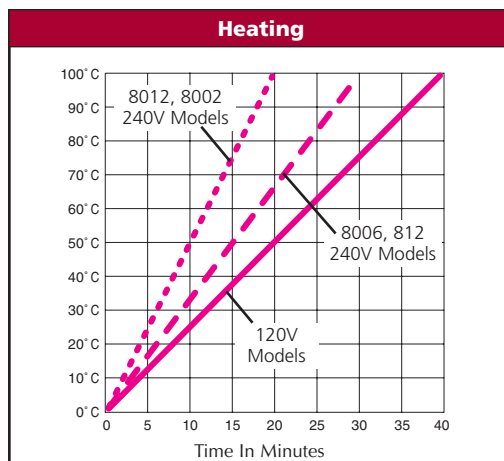
Digital Model 8002. A fine choice for more modest applications and budgets, the 8002 features the same temperature range and stability as the 8012 as well as a full graphic LCD display with multi-language help menus. Other standard features include a powerful 5-speed pressure/suction (duplex) pump for open or closed loop applications and integral RS232 interface.

Standard Model 8006. The most economical microprocessor-controlled model in this series, the 8006 has an upper temperature limit of 150°C and a bright set-and-read LED display. Three user-defined temperature buttons make set point changes quick and simple. The 2-speed pressure (simplex) pump is suitable for closed loop applications.

Analog Model 812. The lowest priced Heating Circulator in the 8000 Series, the 812 is ideal for use in applications where set point changes are infrequent. Temperature is set via a rotary dial and is read on a supplied alcohol thermometer. The 2-speed pressure (simplex) pump is suitable for closed loop applications.

See pages 4 and 5 for additional controller information.

Compact and Powerful Control 6 Liter



---Tech Tip---

High Temperature Precautions:

Before starting your circulator, set both a **Safety Set** point temperature as well as your operating set point temperature.

The **Safety Set** feature prevents your unit from excessive heat by switching off power to the heater in case of low-liquid level or primary controller failure. This feature has a temperature range of 40°C to 210°C.

8000 Series Specifications	
Reservoir Capacity	6 liters
Over-Temperature Cutoff	Adjustable
Low-Liquid Cutoff	Yes
Working Access l x w x d	5 1/4 x 5 1/4 x 5 1/2 in. 13.3 x 13.3 x 14 cm
Overall Dimensions l x w x h	14 1/4 x 8 1/4 x 14 in. 37.5 x 21 x 35.6 cm
Pump Inlet and Outlet	1/4 in. FPT Rear Discharge

---Tech Tip---

High Temperature Precautions:

- ✓ Select a fluid with a flash point well above the operating temperature.
- ✓ Silicone oils are preferred over mineral oil which may smoke or burn.
- ✓ Place circulator in a fume hood if noxious vapors may be present.
- ✓ Use high temperature tubing and tubing adapters. See page 30 for accessories.

8000 Series Applications

- Aging Studies
- Calibration
- Densitometers
- Extractor - Concentrators
- DNA Melting Curves
- Enzyme Assays
- Kinetic Research
- Polymer Studies
- Petroleum Testing
- Temperature Gradients
- Spectrophotometers
- Viscosity Studies

Specifications	Model 8012	Model 8002	Model 8006	Model 812
Temperature Range	Ambient +5° to 200°C	Ambient +5° to 200°C	Ambient +5° to 150°C	Ambient +5° to 100°C
Temperature Stability	±0.01°C	±0.01°C	±0.05°C	±0.2°C
Controller / RS232	Programmable / Yes	Digital / Yes	Standard / No	Analog / No
Readout	Graphic LCD	Graphic LCD	LED	Thermometer (supplied)
Readout Accuracy	±0.25°C	±0.25°C	±0.5°C	N/A
Temperature Readout	°C or °F	°C or °F	°C or °F	N/A
Pressure Flow Rate	5-speed, 12 to 25 lpm	5-speed, 12 to 25 lpm	2-speed, 9 or 15 lpm	2-speed, 9 or 15 lpm
Suction Flow Rate	5-speed, 8 to 18 lpm	5-speed, 8 to 18 lpm	N/A	N/A
Heater	60Hz: 1100 Watts 50Hz: 2200 Watts	1100 Watts 2200 Watts	1100 Watts 1600 Watts	1100 Watts 1600 Watts
Shipping Weight	29 lbs / 13.3 kg	29 lbs / 13.3 kg	23 lbs / 10.5 kg	23 lbs / 10.5 kg
Cat. No. 120V, 50/60Hz, 11A	062920	062900	062751	062760
Cat. No. 240V, 50/60Hz, 9.8A	062925	062905	062756	062761

Note: Performance specifications determined at ambient temperature of 20°C/68°F.

Accessories on pages 30 and 31.

Programmable Model Accessories:

- Remote Probe:
10 ft. - 060101
25 ft. - 060105
50 ft. - 060110

-Digital to Analog Adapter: 060120

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Heating Circulators

The 8100 Series

8100 Series Features

- Above Ambient Temperature Control
- 13 Liter Reservoir
- Large Reservoir Opening
- Small Footprint, Low Profile
- Carrying Handles For Easy Placement

These medium capacity 8100 Series Heating Circulators are ideal for maintaining larger or multiple samples at temperatures from 5°C above ambient to 150°C.

They feature powerful, high-wattage heaters to provide excellent temperature stability and respond quickly to changes in heat demand.



Programmable Model 8112. Our best 8100 Series Circulator, the 8112 provides precise temperature control from 5°C above ambient to 150°C and features time/temperature programming, remote probe capability, and a 5-speed pressure/suction (duplex) pump. An RS232 interface and PC programming software are standard while LabView™ drivers and Excel® macros provide even greater programming and data logging convenience. A full graphic LCD display with multi-language help menus simplify operation and set-up.

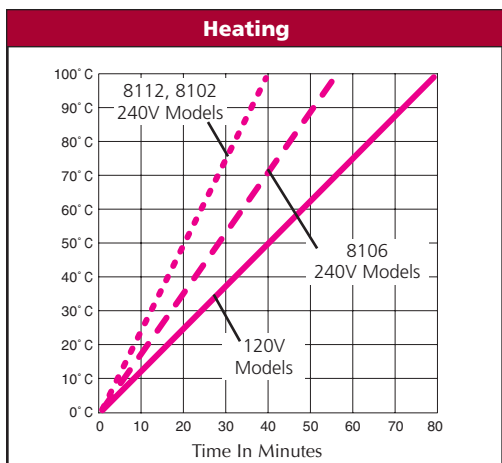
Digital Model 8102. A bit less full-featured than our Programmable model, the 8102 offers identical temperature performance at a more modest price. Standard features include a full graphic LCD display with multi-language help menu, powerful 5-speed pressure/suction (duplex) pump for open or closed loop applications, and integral RS232 interface.

Standard Model 8106. The most economical microprocessor-controlled model in this series, the 8106 also provides ambient +5°C to 150°C temperature control. It features a bright set-and-read LED display, three user-defined temperature set point buttons, and a 2-speed pressure (simplex) pump suitable for closed loop applications.

See pages 4 and 5 for additional controller information.

Compact and Powerful Control

13 Liter



---Tech Tip---

If you operate above 90°C, be aware of the following:

- ✓ Heat loss from vapor may cause poor temperature stability.
- ✓ Use a cover and floating hollow balls to help prevent heat and vapor loss.
- ✓ Fluid lost from vapor will have to be frequently replenished.
- ✓ If fluid other than water is used, a fume hood may be required to prevent the buildup of vapors inside the room.

8100 Series Specifications	
Reservoir Capacity	13 liters
Over-Temperature Cutoff	Adjustable
Low-Liquid Cutoff	Yes
Working Access l x w x d	5 1/4 x 8 1/2 x 7 3/4 in. 13.3 x 21.6 x 19.7 cm
Overall Dimensions l x w x d	15 1/2 x 10 7/8 x 14 3/4 in. 39.4 x 27.6 x 37.5 cm
Pump Inlet and Outlet	1/4 in. FPT Rear Discharge

Specifications	Models 8112	Models 8102	Models 8106
Temperature Range	Ambient +5° to 150°C	Ambient +5° to 150°C	Ambient +5° to 150°C
Temperature Stability	±0.01°C	±0.01°C	±0.5°C
Controller / RS232	Programmable / Yes	Digital / Yes	Standard / No
Readout	Graphic LCD	Graphic LCD	LED
Readout Accuracy	±0.25°C	±0.25°C	±0.5°C
Temperature Readout	°C or °F	°C or °F	°C or °F
Pressure Flow Rate	5-speed, 12 to 25 lpm	5-speed, 12 to 25 lpm	2-speed, 9 or 15 lpm
Suction Flow Rate	5-speed, 8 to 18 lpm	5-speed, 8 to 18 lpm	N/A
Heater	60Hz: 1100 Watts 50Hz: 2200 Watts	1100 Watts 2200 Watts	1100 Watts 1600 Watts
Shipping Weight	39 lbs / 17.8 kg	39 lbs / 17.8 kg	33 lbs / 15 kg
Cat. No. 120V, 50/60Hz, 11A	062960	062950	062942
Cat. No. 240V, 50/60Hz, 9.8A	062961	062951	062943

Note: Performance specifications determined at ambient temperature of 20°C/68°F.

8100 Series Applications

- Aging Studies
- Calibration
- Densitometers
- Extractor - Concentrators
- DNA Melting Curves
- Enzyme Assays
- Kinetic Research
- Polymer Studies
- Petroleum Testing
- Temperature Gradients
- Spectrophotometers
- Viscosity Studies

Accessories
On pages 30 and 31.

Programmable Model
Accessories:

- Remote Probe:
10 ft. - 060101
25 ft. - 060105
50 ft. - 060110

-Digital to Analog
Adapter: 060120

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Heating Only Circulators

The 8200 Series

8200 Series Features

- Above Ambient Temperature Control
- 28 Liter Reservoir
- Large Reservoir Opening
- Compact Design
- Carrying Handles For Easy Placement

PolyScience 8200 Series Heating Circulators feature spacious 28 liter reservoirs and ambient +5°C to 150°C temperature control to keep large or multiple samples at a constant, stable temperature. Their powerful, high-wattage heaters respond quickly to changes in heat demand and provide excellent temperature stability.

For operational convenience, all 8200 Series feature a large 12¹/₈ x 10³/₈ in. reservoir opening for easy access and carrying handles for added portability.



Programmable Model 8212. Ambient +5°C to 150°C temperature control, ±0.01°C temperature stability, time/temperature programming, and remote probe capability make this PolyScience's best large-capacity Heating Circulator. Other features include 5-speed pressure/suction (duplex) pump, RS232 interface and PC programming software, LabView™ drivers and Excel® macros, and full graphic LCD display with multi-language help menus.

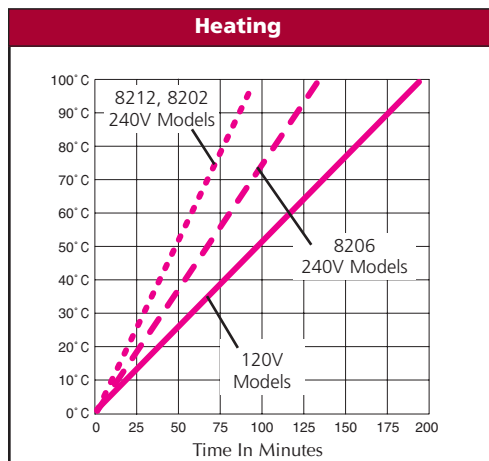
Digital Model 8202. The same broad temperature control range and excellent temperature stability performance of our top of the line model at a more modest price. Standard features include a full graphic LCD display with multi-language help menus, powerful 5-speed pressure/suction (duplex) pump for open or closed loop applications, and integral RS232 interface.

Standard Model 8206. Ideal for those on a tight budget, the 8206 is our most economical large-capacity Heating Circulator. As with our other 8200 Series Circulators, it provides ambient +5°C to 150°C temperature control. Standard features include a bright set-and-read LED display, three user-defined temperature set point buttons, and a 2-speed pressure (simplex) pump suitable for closed loop applications.

See pages 4 and 5 for additional controller information.

Compact and Powerful Control

28 Liter



8200 Series Specifications	
Reservoir Capacity	28 liters
Over-Temperature Cutoff	Adjustable
Low-Liquid Cutoff	Yes
Working Access l x w x d	12 ¹ / ₈ x 10 ³ / ₈ x 8 in. 30.8 x 26.4 x 20.3 cm
Overall Dimensions l x w x h	22 ³ / ₄ x 13 ³ / ₁₆ x 14 ³ / ₄ in. 55.8 x 33.5 x 37.5 cm
Pump Inlet and Outlet	¹ / ₄ in. FPT Rear Discharge

8200 Series Applications

- Calibration
- Chromatography Columns
- Densitometers
- Distillation Condensers
- Electrophoresis Apparatus
- General Laboratory Cooling
- Isoelectric Focusing
- Polarimeters
- Refractometers
- Rotary Evaporators
- Spectrophotometers
- Viscometers

Specifications	Models 8212	Models 8202	Models 8206
Temperature Range	Ambient +5° to 150°C	Ambient +5° to 150°C	Ambient +5° to 150°C
Temperature Stability	±0.01°C	±0.01°C	±0.05°C
Controller / RS232	Programmable / Yes	Digital / Yes	Standard / No
Readout	Graphic LCD	Graphic LCD	LED
Readout Accuracy	±0.25°C	±0.25°C	±0.5°C
Temperature Readout	°C or °F	°C or °F	°C or °F
Pressure Flow Rate	5-speed, 12 to 25 lpm	5-speed, 12 to 25 lpm	2-speed, 9 or 15 lpm
Suction Flow Rate	5-speed, 8 to 18 lpm	5-speed, 8 to 18 lpm	N/A
Heater	60Hz 1100 Watts 50Hz 2200 Watts	1100 Watts 2200 Watts	1100 Watts 1600 Watts
Shipping Weight	49 lbs / 22.3 kg	49 lbs / 22.3 kg	45 lbs / 20.5 kg
Cat. No. 120V, 50/60hz, 11A	062965	062955	062947
Cat. No. 240V, 50/60Hz, 9.8A	062966	062956	062948

Note: Performance specifications determined at ambient temperature of 20°C/68°F.

Accessories on pages 30 and 31.

Programmable Model Accessories:

- Remote Probe:
10 ft. - 060101
25 ft. - 060105
50 ft. - 060110

-Digital to Analog Adapter: 060120

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Model 20 Ambient Bath Cooler



- Aids in Closer-to-Ambient Operation
- Rapidly Cools High Temperature Fluids

Heating circulators can normally control within 5°C to 15°C above ambient. When connected to a heating circulator, this air-cooled heat exchanger rapidly cools fluids from high temperatures, allowing the circulator to control within 2°C of ambient.

A 2-speed fan permits a choice of cooling rates. An external pumping source, such as a heating circulator, is required. Wetted parts are brass and copper.

Model 20 Specifications	
Temperature Range	Up to 200°C
Overall Dimensions l x w x h	8 x 9 x 11 ¹ / ₂ in. 20.3 x 22.6 x 29.2 cm
Inlet and Outlet Fittings	¹ / ₄ in. int. NPT
Shipping Weight	12 lbs / 5.5 kg
Cat. No. 120V, 60Hz, 0.4A	040250
Cat. No. 240V, 50Hz, 0.2A	040251

Circulating Water Bath

The Model 8306

Model 8306 Features

- **Easy-to-Use Microprocessor Controller**
- **Three Preset Temperatures Buttons Permit Rapid Temperature Set Point Changes**
- **28 Liters**
- **External Circulation Capability**
- **Hinged, See-Through Cover**

The Model 8306 Circulating Water Bath is an excellent general purpose bath suitable for a wide variety of laboratory applications, including those requiring external circulation. It is supplied with a sample tray for the bath bottom and thermometer clip. (Thermometer not included).

---Tech Tip---

Use distilled water for temperatures up to 90°C. Do not use deionized water.

For procedures at higher temperatures (i.e., non-coliform testing), use the following guidelines when selecting a bath medium:

- ✓ Use only fluids that meet your safety, health, and equipment requirements.
- ✓ Use a fluid suitable for the temperature range desired.
- ✓ Use a fluid compatible with 300 series stainless steel.



Model 8306

Model 8306. Designed specifically for coliform testing, the Model 8306 features the PolyScience Standard Controller. It incorporates three preset temperature buttons which can be used to rapidly change to common coliform test temperatures, such as 44.5°C, 45.5°C, 41.5°C, and 35.0°C, or other temperatures from ambient +5°C to 150°C.

Bath temperature is displayed on a bright LED readout. A quick press of a knob displays set point and also selects temperature units (°C or °F).

For operational convenience, the Model 8306 is equipped with a tilting, see-through polycarbonate cover which drains back into the bath when opened and an integral 2-speed (simplex) pump which can be used to circulate the bath liquid to other instruments using a closed loop configuration.

All wetted components are corrosion-resistant 300 stainless steel. The outer case is protected with a durable, easy-to-clean epoxy powder coating.

See page 5 for additional information on the Standard Controller used on the Model 8306.

Ideal For Coliform Testing

28 Liter

The Model 8306

This circulating bath is specifically designed to be used for the following Coliform tests:

1. APHA, AWWA, WEF and EPA fecal coliform determination at 44.5°C as specified in "Standard Methods for the Examination of Water and Wastewater" (19th Edition 1995). The membrane filter method or MPM method can be used.
2. AOAC determination of E. coli at 45.5°C.
3. APHA, AWWA, WEF 7-Hour Fecal Coliform test at 41.5°C.
4. Defined Substrate Technology™ tests for E. coli and total coliform at 35.0°C.

Model 8306	
Reservoir Capacity	28 liters
Temperature Range	Ambient +5° to 150°C
Temperature Stability	±0.05°C
Readout	LED, °C or °F to 0.1°
Pump Flow Rate	2-speed, 9 or 15 lpm
Pump Inlet and Outlet	1/4 in. FPT Rear Discharge
Heater	60Hz 1100 Watt 50Hz 2200 Watt
Over-Temperature Cutoff	Adjustable
Low-Liquid Cutoff	Yes
Overall Dimensions l x w x h	14 x 22 x 13 1/2 in. 35.6 X 55.9 x 34.3 cm
Working Access l x w x d	10 1/4 x 11 3/4 x 8 in. 27.3x 29.8 x 20.3 cm
Shipping Weight	49 lbs / 22.4 kg
Cat. No. 120V, 50/60Hz, 11A	062970
Cat. No. 240V, 50/60Hz, 9.8A	062971

Note: Performance specifications determined at ambient temperature of 20°C/68°F.

Model 8306 Applications

Standard Method Coliform Testing
General Bacteriological Testing
Incubation
Routine Laboratory Use
Sample Tempering

Circulate to:

- Refractometers
- Spectrophotometers
- Extractor Concentrators



Model 210, Heating Recirculator

The Model 210 recirculating heater connects to a tank or full cooling system to provide low-cost, accurate control within a frequently used temperature range.

Ideal for routine applications such as thawing plasma, tempering photographic solutions, or circulating to an external device. The sealed reservoir allows use with open baths or closed loop applications.

Fittings for 1/2 in. ID tubing to allow for easy installation. Wetted parts are stainless steel, PVC, brass, or nylon.

- Low-Cost Pumping and Heating
- Open or Closed Loop Applications
- Make Your Own System

Model 210	
Temperature Range	Ambient to 70°C
Temperature Stability	±0.2°C
Reservoir Capacity	0.5 liter
Over-Temperature	Adjustable
Low Liquid Cutoff	Yes
Overall Dimensions l x w x h	8 x 9 1/2 x 8 in. 20 x 24 x 20 cm
Shipping Weight	12 lbs / 5.53 kg
Cat. No. 120V, 60Hz, 7A	040300
Cat. No. 240V, 50Hz, 3.3A	040301

Accessories on Pages 30 and 31.

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Immersion Circulators The 7000 Series

7000 Series Features

- Standard, Analog, or Programmable Controller
- Up to 25 Liter/Minute Pumping Pressure
- Control at Temperatures Up to 200°C
- Integral Temperature and Low-Liquid Level Protection

The PolyScience family of Immersion Circulators makes it easy to create your own unique bath for above ambient temperature control. Simply combine one of our versatile Analog, Standard, or Programmable Controllers with any PolyScience open bath or your own tank or container.

Need time/temperature programming, remote probe, or data logging capability?

See the PolyScience Model 7312 Programmable Immersion Circulator on page 26.



Flexible

Rotating pump flow director accepts 1/2 in. (13mm) ID tubing for closed loop applications.



Easy To Use

Model 7306 offers three user-defined preset buttons for frequently used temperature set points.



Versatile

For additional temperature control flexibility, add an optional cooling coil. See page 30.



Adaptable

Models 7306 and 712 clamp on to a tank's side or can be mounted on to a standard lab stand.



Precise Control

From the ultra-precise programmable models to simple analog control for less demanding applications.



Adjustable

The Model 7312 is built on an expandable bridge that can be suspended over a variety of reservoir tanks.

Choice of Controller Selectable Pump Speed



7000 Series Applications

- Bacteriological Incubation
- Calibration
- Cell Culture
- Enzyme Assays
- Kinetic Research
- Tempering Samples
- Thawing Frozen Specimens
- Warming Culture Media

Standard Model 7306. The PID microprocessor controller provides precise temperature control and greater temperature stability. The 2-speed pressure (simplex) pump minimizes turbulence in small tanks and provide higher flow and greater uniformity in large tanks. An adjustable flow director accepts 1/2 in. (13mm) ID tubing for external circulation.

Analog Model 712. This low-cost circulator offers good temperature control for routine lab applications. Proportional heater control combined with redundant safety backup makes this analog model an excellent value. The 2-speed pressure (simplex) pump minimizes turbulence in small tanks and can provide higher flow and greater uniformity in large tanks. Temperature readout is via the supplied thermometer (non-mercury).

7306 and 712 Model Specifications	
Pumping Flow	9 or 15 lpm
Tank Occupancy, approx.	6 1/2 x 4 3/4 in. / 16.5 x 12.1 cm
Immersion, minimum to maximum	3 in. to 7 in. 7.6 cm to 17.8 cm
Overall Dimensions l x w x h	12 1/4 x 4 5/8 x 5 3/4 in. 31.2 x 11.7 x 14.6 cm
Heater	1100 Watts (60Hz), 2200 Watts (50Hz)
Over-Temperature Cutoff	Adjustable
Low-Liquid Cutoff	Yes
Shipping Weight	11 lbs / 5 kg

Accessories on pages 30 and 31.



Specifications	7306	712
Temperature Range*	Ambient +5°C to 150°C	Ambient +5°C to 100°C
Temperature Stability*	±0.05°C	±0.2°C
Controller	Standard	Analog
Readout	LED	Thermometer (supplied)
Temperature Readout	°C or °F	N/A
Cat. No. 120V, 50/60Hz	052701 (11A)	052550 (11A)
Cat. No. 240V, 50/60Hz	052741 (7.5A)	052555 (7.5A)

* Temperature range and stability may vary depending on bath volume, surface area, insulation and type of fluid.

Note: Performance specifications determined at ambient temperature of 20°C/68°F.

See page 5 for additional controller information.

Programmable Controller The 7000 Series

Model 7312 Features

- Time/Temperature Programmability
- Five Speed Adjustable Pump
- Controllable Through RS232 Interface
- RS232 Cable Supplied
- Remote Probe Capability

Supplied with $\frac{3}{8}$, $\frac{1}{4}$, $\frac{3}{16}$ inch ID tubing adapters.

Accessories on pages 30 and 31.



Model 7312 shown here in the 21 liter acrylic tank. See page 27 for tank information.



Model 7312 Specifications	
Temperature Range*	Ambient +5° to 200°C
Temperature Stability*	±0.01°C
Controller / RS232	Programmable / Yes
Readout	Graphic LCD
Temperature Readout	°C or °F
Pumping Pressure	5-speed, 12 to 25 lpm
Pumping Suction	5-speed, 8 to 18 lpm
Tank Occupancy, approx.	7 $\frac{1}{2}$ x 8 $\frac{3}{4}$ in.
Immersion, minimum to maximum	2 $\frac{1}{2}$ in. to 4 $\frac{1}{2}$ in. 7 cm to 11.4 cm
Overall Dimensions l x w x h	11 $\frac{1}{4}$ x 15 x 9 $\frac{1}{2}$ in. 28.6 x 38 x 24.2 cm
Heater	1100 Watts (60Hz), 2200 Watts (50Hz)
Over-Temperature Cutoff	Adjustable
Low-Liquid Cutoff	Yes
Pump Inlet and Outlet	$\frac{1}{4}$ in. FPT Rear Discharge
Shipping Weight	24 lbs / 11 kg
Cat. No. 120V, 50/60Hz, 11A	052780
Cat. No. 240V, 50/60Hz, 9.7A	052781

* Temperature range and stability vary depending on bath volume, surface area, insulation, and type of fluid.

Note: Performance specifications determined at ambient temperature of 20°C/68°F.

Programmable Model 7312. The full-featured PolyScience Programmable Controller, combined with circulator placement flexibility, makes this “design your own bath” circulator a great value. Microprocessor PID control assures high accuracy and stability.

The Programmable Controller features a multi-language graphic display and time/temperature programming. Ten programs can be stored in the controller's memory; each can have up to fifty steps and can be cycled up to 999 times. An RS232 interface and remote probe capability are standard. The included software supports LabView™ drivers and Excel® macros to offer even greater programming and data logging convenience

For internal circulation or external open and closed loop applications, the 7312 has a strong pressure and suction (duplex) pump with five selectable speeds. The optional remote probe gives more accurate temperature control in applications where external circulation is required.

The expandable mounting bridge spans openings from 15 to 25 in. across to allow placement on almost any bath container. Choose from PolyScience's selection of stainless steel or acrylic baths or use your own reservoir.

See page 4 for additional controller information.

Open Bath Tanks



Open Baths

These open baths are recommended for use with PolyScience Immersion Circulators or where a container with the corrosion resistance of stainless steel or visibility of clear acrylic is needed.

Acrylic Open Baths. Provide good visibility of immersed samples, never rust, and cost less than stainless steel baths. The upper working limit of these acrylic baths is 70°C. The bottoms are elevated 2 1/8 in. (5.4 cm) to allow placement of low-profile magnetic stirrers or other devices beneath the bath.

Stainless Steel Baths. Seamless, insulated, and coated with a durable epoxy powder finish. Carrying handles included. These baths can be used for fluid temperatures up to 300°C.

Refrigerated Stainless Steel Bath. Designed for use with an immersion circulator or other device which will control the bath temperature. Without an accessory heating controller, this model cools fluid, uncontrolled, down to the limit of its capability. In conjunction with a PolyScience Immersion Circulator, it can produce stable temperatures from 0°C to 150°C.

Refrigerated Stainless Steel Bath	
Capacity	13 liters
Temperature Range	0° to 150°C
Cooling Capacity @	20°C 400 Watts
	10°C 270 Watts
	0°C 90 Watts
Working Access l x w x d	9 x 11 3/4 x 7 3/4 in. 22.9 x 29.8 x 19.7 cm
Overall Dimensions l x w x d	13 1/2 x 22 x 10 in. 34.3 x 55.9 x 25.4 cm
Shipping Weight	60 lbs / 27.3kg
Cat. No. 120V, 60Hz, 3A	040525
Cat. No. 240V, 50Hz, 1.5A	040530

Notes: Cooling capacity (Watts x 3.41) = BTU/hr. Performance specifications determined at ambient temperature of 20°C/68°F. For 50Hz units, derate cooling capacity by 17%.

Acrylic Baths	Temperature Limit 70°		
Capacity	8 liter	16 liter	21 liter
Working Access l x w x d	18 x 5 x 7 1/2 in. 45.7 x 12.7 x 19 cm	18 x 10 x 7 1/2 in. 45.7 x 25.4 x 19 cm	18 x 13 1/8 x 7 1/2 in. 45.7 x 33.3 x 19 cm
Shipping Weight	7 lbs / 3.2 kg	9 lbs / 4.1 kg	11 lbs / 5 kg
Cat. No.	040700	040705	040710

Stainless Steel Baths	Temperature Limit 300°	
Capacity	13 liter	28 liter
Working Access l x w x d	9 x 11 3/4 x 7 3/4 in. 22.9 x 29.8 x 19.7 cm	11 3/4 x 19 1/2 x 7 3/4 in. 29.8 x 49.5 x 19.7 cm
Shipping Weight	15 lbs / 6.8 kg	25 lbs / 11.4 kg
Cat. No.	040510	040520

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PolyScience Coolers

The KR and VLT Series

KR and VLT Features

- VLT Series Models Now Available with Digital Set/Read Controller
- Compact Package
- Low-Cost Operation
- Designed For Continuous Use
- Replaces Dry Ice or Liquid Nitrogen



PolyScience KR and VLT Series Coolers can be used to achieve low-temperature capability with non-refrigerated circulators or boost the cooling capacity of refrigerated circulators. The VLT 60 and VLT 100 are available with a digital set/read controller providing temperature control in your cooling application. All KR Series models are designed to run at maximum cooling rate; temperature control must be provided by an external circulator.

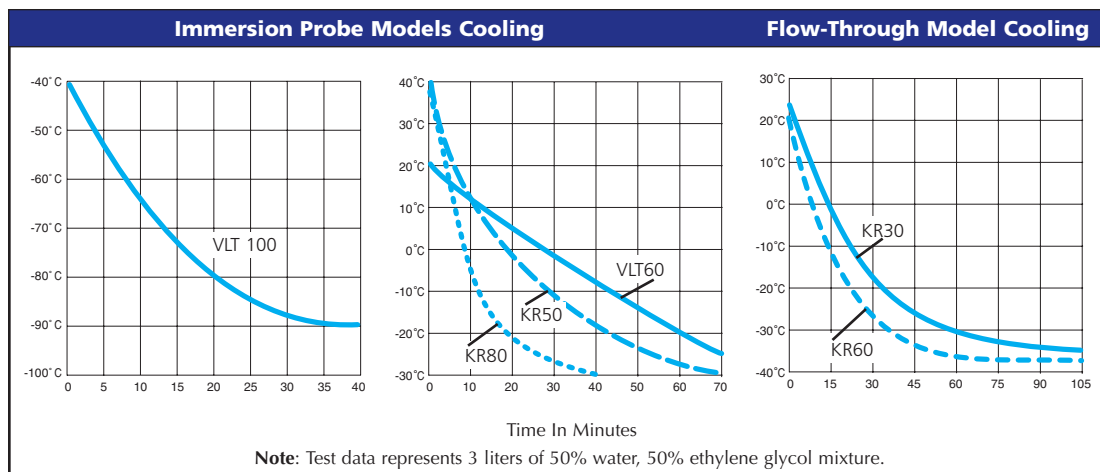
Immersion Probe style coolers are excellent for trapping and dewar type applications and can be used to reduce the expense of using dry ice or liquid nitrogen. A flexible hose allows convenient placement of the cooling probe.

Flow-Through style coolers must be used in-line with a circulator pump. Because of their high cooling efficiency, an anti-freeze solution is required in the circulating system.

Specifications	VLT 100-SC	VLT 100	VLT 60-SC	VLT 60
Operating Range	-100° to -40°C		-60° to -20°C	
Temperature Display	LED	N/A	LED	N/A
Compressor	Two, 1/4 HP each		Single 1/4 HP	
Cooling Capacity @	-20°C	160 Watts	75 Watts	
	-60°C	110 Watts	0 Watts	
	-90°C	0 Watts	N/A	
Flexible Probe, length	5 ft.		5 ft.	
Exposed Probe, length x diameter	20 in. x 7/16 in. / 50.8 x 1.11 cm		20 in. x 7/16 in. / 50.8 x 1.11 cm	
Overall Dimensions l x w x h	20 x 10 x 18 1/2 in. / 50.8 x 25.4 x 47 cm		11 x 10 x 9 in. / 27.9 x 25.4 x 22.9 cm	
Shipping Weight	100 lbs / 45.5 kg		49 lbs / 22.3 kg	
Cat. No. 120V, 60Hz, 5A	082625	082623	072970	072960
Cat. No. 240V, 50Hz, 2.5A	082626	082624	072971	072965

Note: Cooling capacity (Watts x 3.41) = BTU/hr. Performance specifications determined at ambient temperature of 20°C/68°F. For 50Hz units, derate cooling capacity by 17%.

Immersion Probe and Flow-Through Styles



The Flexible Cooling Probe used in the VLT Immersion Series provide to temperature as low as -100°C .



The Probe Coil used in the KR Immersion Series provide to temperature as low as -45°C .

KR and VLT Applications

- Cooling Exothermic Reactions
- Freezing Point Determinations
- Impact Testing
- Lyophilization
- Quick Cooling
- Replace Dry ice
- Solvent Traps
- Vacuum Traps

Immersion Probe	KR 50	KR 80
Operating Range	-35° to 40°C	-45° to 40°C
Cooling Capacity @ -30°C @ 20°C	140 Watts 975 Watts	265 Watts 1050 Watts
Probe Coil, diameter x length	1 1/2 x 4 in. / 3.8 x 10.2 cm	3 x 9 1/4 in. / 7.6 x 23.5 cm
Dimension, l x w x h	17 x 14 x 14 in. / 43.2 x 35.6 x 35.6 cm	17 x 14 x 14 in. / 43.2 x 35.6 x 35.6 cm
Shipping Weight	76 lbs / 34.5kg	82 lbs / 37.3 kg
Cat. No. 120V, 60Hz, 5A	070850	070880
Cat. No. 240V, 50Hz, 2.5A	070855	070885

Accessories on pages 30 and 31.

Flow-Through Models	KR 30	KR 60
Operating Range	-20° to 40°C	-25° to 40°C
Cooling Capacity @ -30°C @ 20°C	200 Watts 575 Watts	260 Watts 745 Watts
Inlet and Outlet Size	3/8 in. FPT	3/8 in. FPT
Dimension, l x w x h	17 x 14 x 14 in. / 43.2 x 35.6 x 35.6 cm	17 x 14 x 14 in. / 43.2 x 35.6 x 35.6 cm
Shipping Weight	72 lbs / 32.6 kg	78 lbs / 35.5 kg
Cat. No. 120V, 60Hz, 5A	070830	070860
Cat. No. 240V, 50Hz, 2.5A	070835	070865

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Note: Cooling capacity (Watts x 3.41) = BTU/hr. Performance specifications determined at ambient temperature of $20^{\circ}\text{C}/68^{\circ}\text{F}$. For 50Hz units, derate cooling capacity by 17%.

Accessories

Cooling Coils

For auxiliary cooling of circulators. The stainless steel coil, when connected to a water source, permits more rapid cool down from high temperatures or better control when operating close to ambient temperatures. Not recommended for use in circulator baths where fluid temperature exceeds the boiling point of water. For high temperature cool-down, we recommend Model 20, page 21.



For Heating Circulators Cat. No. 060300

For Model 72 and 7306 Cat. No. 050300

Digital-to-Analog Adapter

For circulators with Programmable Controller when direct digital control is not required. Connects to the RS232 port and provides 10mv/degree analog signal for external monitoring or control.

Cat. No. 060120

Glass Thermometer (non-mercury)

-20° to 150°C, 1°C **Cat. No. 099590**

Remote Probe

For circulators with Programmable Controller. Permits point of control to be switched from inside programmable circulator bath to a remote location, such as an open tank. Compensates for heat loss through tubing between the circulator and the control point. Platinum RTD sensor with stainless steel sheath ³/₁₆ dia. x 6 in. long (.47 dia. x 15.2 cm). One inch (2.54 cm) rubber coupling connects sheath to flexible cable. Probe cable ends in DB9 female plug.



10 ft. (3 m) Cat. No. 060101

25 ft. (7.6m) Cat. No. 060105

50 ft. (15.25m) Cat. No. 060110

Custom lengths available on special order.

Hollow Plastic Floating Balls

Create a blanket of insulation in any open bath, reducing heat loss 75% and evaporation by 87%. Also reduces fumes and splashing hazards. Usable to temperatures to 110°C and in most bath fluids. Made of polypropylene.



³/₄ in. (20 mm) diameter,

Pack of 400 Cat. No. 060301

Tubing and Tubing Accessories

High-Temperature Tubing

3 ft. (.93m) flexible Teflon® lined, stainless steel over-braid tubing with ¹/₂ in. NPT quick-connects at both ends. Maximum temperature 300°C.

3 ft. (.93m) Cat. No. 060310

Low-Temperature Insulated Tubing

Minimizes temperature loss from a circulator to external device. 6 ft. (1.9 m) of ¹/₂ in. (1.27 cm) ID Buna N tubing with foam insulation.

6 ft. (1.9m) Cat. No. 060312

Tubing Clamp

3 mm to 13 mm tubing **Cat. No. 060304**

Brass Reducing Adapters

8 mm ID (Set of 2) **Cat. No. 060305**

3 mm (Set of 2) **Cat. No. 060306**

Buna N Tubing

8 mm ID per yard (.9m) **Cat No. 060307**

13 mm ID per yard (.9m) **Cat No. 060308**

Insulation

8 mm tubing per yard (.9m) **Cat. No. 060309**

13 mm tubing per yard (.9m) **Cat. No. 060311**

Accessories

Accessories

Lab Algicide

General purpose lab algicide helps keep water baths clean, odor free, and resistant to black algae. Stainless steel compatible. Use 10 to 15 drops per gallon to prevent algae growth. 8 oz. (236 ml) dispenser bottle treats approximately 400 gallons (1514 liters).



8 oz. bottle Cat. No. 4-300040

Concentrated Bath Cleaner

A concentrated liquid for cleaning and removing rust and mineral deposits from stainless steel and plastic baths. Use at elevated temperatures. Helps remove existing algae prior to treatment with Lab Algicide. 1 oz. (33.8 ml) treats approximately 200 gallons (757 liters).



8 oz. bottle Cat. No. 4-300050

16 oz. bottle Cat. No. 4-300052

Bath Fluids

Low Temperature - Dynalene HC-50™ combines the low-temperature performance of synthetic organic and silicone fluids while extending the properties of familiar aqueous-based glycols. Excellent low-temperature performance without toxicity or risk to the environment, equipment, or personnel.

High Temperature - Dow Corning® Silicone Heat Transfer Fluids provide superior thermal stability over their temperature ranges. Check bath system compatibility before using. Compatible with stainless steel; not compatible with Buna or natural rubber.



	Temperature Range	Freeze Point	Viscosity	Quantity	Cat. No.
Dynalene HC™	-53° to 60°C -63° to 140°F	-56°C -68°F	3.6 cSt @ 0°C 15.1 cSt @ -40°C	1 gallon 3.79 liters	060330
Dow Corning® 510	50° to 150°C 122° to 302°F	-70°C -94°F	50 cSt @ 25°C	1 gallon 3.79 liters	060326
Dow Corning® 550	100° to 200°C 212° to 392°F	-50°C -58°F	125 cSt @ 25°C	1 gallon 3.79 liters	060327
Dow Corning® 710	150° to 250°C 302° to 482°F	-22°C -7.6°F	500 cSt @ 25°C	1 gallon 3.79 liters	060328

Due to high viscosity, Silicone Fluids 510, 550, and 710 are not recommended for use below 90°C.

Dow Corning fluids are produced by and registered TMs of Dow Corning Corporation.

Dynalene HC is a registered TM of Advanced Fluid Technologies, Inc.

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PolyScience offers the new **DURACHILL™** line of Industrial Capacity Chillers. They provide high performance cooling even in high ambient conditions.