# Chillers and Coolers

# **Chillers and Coolers**

# PolyScience has the right equipment for virtually any end-user or OEM application.

PolyScience Chillers and Coolers have proven – over several decades and hundreds of thousands of Original Equipment Manufacturer (OEM) installations ranging from lasers to analytical equipment, reactors and manufacturing equipment – that they are the most reliable in the industry. We understand that precise temperature control can make or break a complex piece of machinery. Our Chillers and Coolers provide consistent performance day after day, year after year. And that means they are the smartest choice for clients all over the world.

### Compact, Benchtop Chillers

Our powerful, low-temperature chillers are well matched for use with rotary evaporators, vacuum systems, spectrometers, and other analytical instrumentation. They also are available with a mobile cart accessory for convenient placement under a bench.

### • 6000 Series Recirculating Chillers

Why run a fan at its highest speed and noise level when a fraction will do? Typical cooling fans have two speeds – full speed and off. PolyScience's patentpending WhisperCool™ technology automatically adjusts the cooling fan speed to match the demand put on the system exactly – making these high performance Recirculating Chillers exceptionally quiet and environmentally friendly.

#### • DuraChill™ Recirculating Chillers

Designed for high heat removal in demanding environments, our DuraChill™ Chillers provide robust and reliable temperature control for closed, external systems such as pilot plants, medical diagnostic equipment, metalworking lasers, and plastic molding machines. These chillers are suitable for most applications with their many options and accessories.

• Recirculating Coolers (Non-Refrigerated) Available in both Liquid-to-Air and Liquid-to-Liquid models, PolyScience Recirculating Coolers deliver extremely quiet and energy-efficient heat removal. They provide significant cooling for set-points above ambient, without the energy consumption of refrigerated chillers.

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MM Series



#### Chiller Selection Guide Based On Heat Removal (kW)

| Cooling Range                  | .5 kW | 1 kW | 2 kW | 3 kW | 4 kW | 5 kW | 6 kW | 8 kW | 10 kW | 30 kW | 50 kW |
|--------------------------------|-------|------|------|------|------|------|------|------|-------|-------|-------|
| Chillers (refrigerated)        |       |      |      |      |      |      |      |      |       |       |       |
| LS, LM, and MM Benchtop Models |       |      |      |      |      |      |      |      |       |       |       |
| 6000 Series Portable Models    |       |      |      |      |      |      |      |      |       |       |       |
| DuraChill™ Portable Models     |       |      |      |      |      |      |      |      |       |       |       |
| Coolers (non-refrigerated)     |       |      |      |      |      |      |      |      |       |       |       |
| Model 3370 Liquid-to-Air       |       |      |      |      |      |      |      |      |       |       |       |
| Model 4100 Liquid-to-Liquid    |       |      |      |      |      |      |      |      |       |       |       |

PolyScience Recirculating Chillers and Recirculating Coolers provide stable, reliable and quiet temperature control over a broad range of cooling capacities for lasers, analytical instrumentation, biological experiments, and other temperature-sensitive equipment and applications.



# Features:

# • Precise & reliable

Engineered and field-proven to deliver industryleading performance, PolyScience Recirculating Chillers and Coolers provide dependable and efficient heat removal day in, day out, year after year.

# • Easy to operate

Setting temperature and operational parameters is intuitive and straightforward.

# Globally supported

PolyScience ensures responsive local support through our global distribution and service network that spans 6 continents and 70 countries.

# • Quiet

Our commitment to noise reduction in your working environment, including our patent-pending WhisperCool™ technology, helps make your cooling application exceptionally quiet and energy efficient.

# Informative

Digital temperature display, digital pressure/flow rate display, and fluid level gauge let you check key process information with just a glance.

# • Secure

Local lockout prevents unauthorized set-point or operational changes. User-adjustable temperature limits prevent unintended set-point changes, warn you when process temperature rises too high or drops too low.



#### Low maintenance

Readily accessible, reusable fluid and air filters are easily removed for cleaning, helping simplify maintenance and ensuring energy efficiency.

### Versatile

Whether your application calls for high flow at low pressure, low flow at high pressure, or something in between, PolyScience Recirculating Chillers can deliver. Each unit is available with multiple pump options ensuring a good fit for most process requirements.

# Customizable

Broad selection of factory installed options – such as remote control, ambient temperature tracking, serial communication, and deionized water packages to name just a few – makes it easy to customize your PolyScience Chiller or Recirculating Cooler to your facility's and application's unique needs.

# Cool Command<sup>™</sup>

Advanced refrigeration technology carefully monitors heat load to deliver the precise amount of cooling needed. The result? Exceptional temperature control – over the entire temperature range – as well as more reliable and energy-efficient cooling.

# Chiller Selection Guide: Benchtop & 6000 Series

| - |  |
|---|--|
|   |  |

Benchtop Chillers



Portable 6000 Series Chillers

|                            |                 | Air-Cooled       |                  |            |              | Air-Cooled                     |                               |            |  |
|----------------------------|-----------------|------------------|------------------|------------|--------------|--------------------------------|-------------------------------|------------|--|
|                            | MM              | LM               | LS               | 6200       | 6300         | 6500                           | 6700                          | 6100       |  |
| Cooling Capacity @ 20°C1   | 460 W           | 560 W            | 1290 W           | 950 W      | 1430 W       | 1800 W                         | 2350 W                        | 2900 W     |  |
| Temperature Range          | -5° to<br>+50°C | -10° to<br>+30°C | -20° to<br>+40°C |            | (-10° to +7( | -10° to +40°C<br>0°C with heat | 2<br>ter option) <sup>2</sup> |            |  |
| Temperature Stability      | ±0.1°C          | ±0.1°C           | ±0.1°C           | ±0.1°C     | ±0.1°C       | ±0.1°C                         | ±0.1°C                        | ±0.1°C     |  |
| Maximum Pressure psi (bar) | 14.5 (1.0)      | 14.5 (1.0)       | 14.5 (1.0)       | 100 (6.9)  | 100 (6.9)    | 100 (6.9)                      | 100 (6.9)                     | 100 (6.9)  |  |
| Maximum Flow gpm (I/min)   | 3.5 (13.2)      | 3.5 (13.2)       | 3.9 (14.8)       | 4.1 (15.5) | 4.1 (15.5)   | 4.1 (15.5)                     | 4.1 (15.5)                    | 4.1 (15.5) |  |
|                            |                 |                  |                  |            |              |                                |                               |            |  |

1. Cooling Capacity based on 20°C (68°F) ambient temperature and a 50%/50% mix of ethylene glycol and distilled water as coolant.

2. Heater option extends cooling range to 50°C, provides heat up to 70°C.

3. Cooling capacity for 5.2 - 10.5 kw chillers based on 20°C (68°F) ambient temperature and a 50%/50% mix of ethylene glycol and distilled water as coolant. Cooling capacity for 16.3 - 33.5 kw chillers based on 35°C/95°F entering air, 49°C/120°F condensing temperature, and 10°C/50°F leaving water. Allowance made for heat gain from pump.

4. Cooling capacity for 3370 based on 11°C temperature differential between ambient air temperature and cooling fluid temperature.

5. Cooling capacity for 4100 given at 30°C using 20°C facility water.

# Chiller Selection Guide: DuraChill™

|             |             |             | Portable Dura | Chill™ Chillers <sup>3</sup> | -          |                 |                 | Non-Refriger           | rated Coolers                     |
|-------------|-------------|-------------|---------------|------------------------------|------------|-----------------|-----------------|------------------------|-----------------------------------|
| Air-Cooled  | Air-Cooled  | Air-Cooled  | Air-Cooled    | Air-Cooled                   | Air-Cooled | Water<br>Cooled | Water<br>Cooled | Air-Cooled             | Water<br>Cooled                   |
| 6860        | DCA200      | DCA300      | DA500         | DA750                        | DA1000     | 6960            | DCW300          | 3370                   | 4100                              |
| 5200 W      | 7000 W      | 10,500 W    | 16,384 W      | 22,361 W                     | 33,436 W   | 6328 W          | 10,936 W        | $4000 W^4$             | 10,000 W <sup>5</sup>             |
| 5° to 35°C  | 5° to 35°C  | 5° to 35°C  | 0° to 30°C    | 0° to 30°C                   | 0° to 30°C | 5° to 35°C      | 5° to 35°C      | Ambient<br>+5° to 70°C | Facility<br>Water<br>+10° to 60°C |
| ±0.5°C      | ±0.5°C      | ±0.5°C      | ±1.11°C       | ±1.11°C                      | ±1.11°C    | ±0.5°C          | ±0.5°C          | N/A                    | ±0.4°C                            |
| 100 (6.9)   | 20.5 (1.41) | 20.5 (1.41) | 40 (2.8)      | 40 (2.8)                     | 55 (3.8)   | 100 (6.9)       | 20.5 (1.41)     | 100 (6.9)              | 100 (6.9)                         |
| 3.5 (13.25) | 12 (45.1)   | 12 (45.1)   | 50.2 (190)    | 50.2 (190)                   | 64.7 (245) | 3.5 (13.25)     | 12 (45.1)       | 5.4 (20.5)             | 3.5 (13.2)                        |

Specifications listed are for 60 Hz models. For specifications on 50 Hz models see Technical Specification pages 150 thru 153. Benchtop Chillers, 6000 Series Chillers, DuraChillTM Chillers, and Non-Refrigerated Coolers may have the following wetted parts present: Polypropylene, nylon, SBR rubber, stainless steel, bronze, brass.

# A Variety of Pump Options

#### Turbine:

Provide moderate flow but at higher pressures which make them well suited to applications that require higher pressure or experience a higher pressure drop. A robust design makes turbine pumps very reliable and more forgiving to impurities in the fluid stream.

#### Positive Displacement Pumps:

Have performance characteristics similar to turbine pumps and are suitable for high viscosity fluids, or pumping higher or further from the cooling product and the application.

#### Centrifugal Pumps (Magnetic Drive):

Offer higher relative flow rates at lower pressures and are suitable for applications that are in close proximity to the chiller or require lower pressure. Centrifugal pumps are more sensitive to pressure drops.



Flow

# **Benchtop Chillers -**LS Series -20° to +40°C

#### **Key Specifications**

Working Temperature: -20° to +40°C Temperature Stability: ±0.1°C Cooling Capacity: Reservoir Capacity: **Overall Dimensions**  $(L \times W \times H)$ :

Up to 1290 W @ 20°C 0.7 gallons/2.65 liters 23.9 x 10 x 19" 60.7 x 25.4 x 48.3 cm



# **Features:**

- Optimized for high performance at low temperatures
- · Capable of cooling multiple rotary evaporators
- WhisperCool<sup>™</sup> Environmental Control System
- Large, easy to read LED display
- Space-saving design
- Cooling at ambient temperatures as high as 35°C
- · Low flow shutoff and alarm, high and low temperature alarms

- Simple setup, operation, and maintenance
- Choice of pumps
- Fluid level indicator





Front mounted fluid level gauge lets you quickly determine if coolant needs to be added to the reservoir.

See pages 109 through 112 for LS Series Chiller options and accessories.

| Working Temperature Range              |   | -20° to +40°C                                     |   |   |   |   |  |  |  |  |
|--|---|---|---|---|---|---|--|--|--|--|
| Temperature Stability                  |   |   |   | ±O  | ).1°C   |   |  |  |  |  |
|  |   | Cent  | rifugal   | Cent  | rifugal   | Turbine   |  |  |  |  |
| Pump Type                              |   | M1 (60 Hz)  | M2 (50 Hz)  | MX (60 Hz)  | MY (50 Hz)  | M1 (60 Hz)                                      | M2 (50 Hz)                                     |  |  |  |
| Cooling Capacity <sup>1</sup> @<br>(W) | -20°C<br>-10°C<br>0°C<br>+10°C<br>+20°C<br>+30°C<br>+40°C | 230<br>435<br>680<br>1030<br>1160<br>1380<br>1550 | 230<br>435<br>680<br>1030<br>1160<br>1380<br>1545 | 260<br>475<br>750<br>1130<br>1290<br>1460<br>1610 | 240<br>460<br>700<br>1070<br>1190<br>1420<br>1580 | 150<br>345<br>540<br>790<br>900<br>1020<br>1140 | 140<br>330<br>500<br>750<br>830<br>990<br>1105 |  |  |  |
| Maximum Pressure psi (bar)             |   | 9.0 (0.6)   | 5.5 (0.4)   | 14.5 (1.0)  | 10.5 (0.7)  | 43.4 (3.0)                                      | 32 (2.2)                                       |  |  |  |
| Maximum Flow gpm (I/min)               |   | 3.9 (14.8)  | 3.4 (12.9)  | 3.5 (13.2)  | 3.1 (11.7)  | 2.6 (9.8)                                       | 2.2 (8.3)                                      |  |  |  |
| Part Number 120 VAC/60 Hz              |   | LS51M   | 11A110C   | LS51M   | X1A110C   | LS51TX1A110C                                    |  |  |  |  |
| Part Number 240 VAC/                   | 50 Hz   | LS52M21A110E                                      |   | LS52M   | IY1A110E  | LS52TY1A110E                                    |  |  |  |  |

1. Cooling Capacity based on 20°C (68°F) ambient temperature and a 50%/50% mix of ethylene glycol and distilled water as coolant. Electrical plugs for the part numbers listed are standard U.S. and European types. See page 128 for additional plug types and part numbers. See pages 124 and 125 for considerations when choosing a chiller.

# Economical Cooling for Rotary Evaporators

LS Series Chillers are capable of simultaneously cooling two or more benchtop rotary evaporators, and provide particularly efficient and economical cooling at temperatures between 0°C and +10°C. Their powerful heat removal capability, combined with a compact design, makes them ideal for any low temperature cooling application where bench space is limited. They can also be placed on a mobile cart accessory, below a bench.



# **Benchtop Chillers –** LM Series -10° to +30°C

**Key Specifications** 

Working Temperature: -10° to +30°C Temperature Stability: ±0.1°C Cooling Capacity: Reservoir Capacity: **Overall Dimensions**  $(L \times W \times H)$ :

Up to 560 W @ 20°C 0.7 gallons/2.65 liters 50.8 x 25.4 x 43.2 cm

# 1

# **Features:**

- Optimized for high performance at low temperatures
- Ideal for benchtop rotary evaporators
- · Large, easy to read LED display
- Space-saving design
- Cooling at ambient temperatures as high as 35°C
- · Low flow shutoff and alarm, high and low temperature alarms
- · Simple setup, operation, and maintenance
- Choice of pumps
- Fluid level indicator





Large, easy to read temperature display lets you check operation at a glance.

| Working Temperature Range            |   | -10° to +30°C                   |                                 |                                 |                                 |  |  |  |
|--------------------------------------|---|---------------------------------|---------------------------------|---------------------------------|---------------------------------|--|--|--|
| Temperature Stability                |   |                                 | ±C                              | ).1°C                           |                                 |  |  |  |
|                                      |   | Centr                           | rifugal                         | Centrifugal                     |                                 |  |  |  |
| Pump Type                            |   | GX (60 Hz)                      | GY (50 Hz)                      | MX (60 Hz)                      | MY (50 Hz)                      |  |  |  |
| Cooling Capacity <sup>1</sup><br>(W) | -10°C<br>0°C<br>+10°C<br>+20°C<br>+30°C | 230<br>350<br>470<br>560<br>650 | 140<br>250<br>390<br>520<br>600 | 170<br>250<br>340<br>420<br>540 | 110<br>170<br>280<br>390<br>500 |  |  |  |
| Maximum Pressure psi (bar)           |   | 5.1 (0.35)                      | 4.4 (0.3)                       | 14.5 (1.0)                      | 12.5 (0.9)                      |  |  |  |
| Maximum Flow gpm (I/min)             |   | 2.1 (7.9)                       | 1.8 (6.8)                       | 3.5 (13.2)                      | 3.0 (11.4)                      |  |  |  |
| Part Number 120 VAC/60 Hz            |   | LM61G                           | X1A110C                         | LM61MX1A110C                    |                                 |  |  |  |
| Part Number 240 VAC/50 Hz            |   | LM62G                           | Y1A110E                         | LM62MY1A110E                    |                                 |  |  |  |

1. Cooling Capacity based on 20°C (68°F) ambient temperature and a 50%/50% mix of ethylene glycol and distilled water as coolant. See pages 109 through 112 for LM Series Chiller options and accessories.

See pages 124 and 125 for considerations when choosing a chiller.

Electrical plugs for the part numbers listed are standard U.S. and European types. See page 128 for additional plug types and part numbers.

# Benchtop Chillers – MM Series -5° to +50°C

#### **Key Specifications**

| Working Temperature:               |
|------------------------------------|
| Temperature Stability:             |
| Cooling Capacity:                  |
| Reservoir Capacity:                |
| Overall Dimensions<br>(L x W x H): |

From -5° to +50°C ±0.1°C Up to 460 W @ 20°C 0.7 gallons/2.65 liters 20 x 10 x 17" 50.8 x 25.4 x 43.2 cm

# 

# Features:

- Precise and stable temperature control at low temperatures
- Large, easy to read LED display
- Space-saving, benchtop design
- Cooling at ambient temperatures as high as 35°C
- Low flow shutoff and alarm, high and low temperature alarms
- Simple setup, operation, and maintenance
- Choice of pumps
- Fluid level indicator





Reusable front-mounted air filter is easily accessible and provides energy efficient cooling.

| Working Temperature Range              |   | -5° to +50°C<br>±0.1°C                 |  |  |  |  |  |  |
|--|---|--|--|--|--|--|--|--|
| Temperature Stability                  |   |  |  |  |  |  |  |  |
|  |   | Centr                                  | ifugal                                 | Centrifugal                            |  |  |  |  |
| Pump Type                              |   | GX (60 Hz)                             | GY (50 Hz)                             | MX (60 Hz)                             | MY (50 Hz)                             |  |  |  |
| Cooling Capacity <sup>1</sup> @<br>(W) | -5°C<br>0°C<br>+10°C<br>+20°C<br>+40°C<br>+50°C | 130<br>215<br>320<br>460<br>520<br>550 | 115<br>190<br>290<br>410<br>470<br>495 | 115<br>195<br>305<br>435<br>505<br>535 | 105<br>175<br>270<br>390<br>450<br>480 |  |  |  |
| Maximum Pressure psi (bar)             |   | 5.1 (0.4)                              | 4.4 (0.3)                              | 14.5 (1.0)                             | 12.5 (0.9)                             |  |  |  |
| Maximum Flow gpm (I/min)               |   | 2.1 (7.9)                              | 1.8 (6.8)                              | 3.5 (13.2)                             | 3.0 (11.4)                             |  |  |  |
| Part Number 120 VAC/60 Hz              |   | MM71G                                  | X1A110C                                | MM71MX1A110C                           |  |  |  |  |
| Part Number 240 VAC/50 Hz              |   | MM72G                                  | Y1A110E                                | MM72MY1A110E                           |  |  |  |  |

1. Cooling Capacity based on 20°C (68°F) ambient temperature and a 50%/50% mix of ethylene glycol and distilled water as coolant. See pages 109 through 112 for MM Series Chiller options and accessories.

See pages 124 and 125 for considerations when choosing a chiller.

Electrical plugs for the part numbers listed are standard U.S. and European types. See page 128 for additional plug types and part numbers.