



SEMICONDUCTOR  
PRODUCTS GROUP

# Polycold® PCC Compact Coolers

Efficient Heat Removal for Demanding Applications

VACUUM PRODUCTS

## Benefits

- Compact size, remote cold end and minimal connections make this a smart solution for most applications
- Low vibration
- Cooling to  $-203^{\circ}\text{C}$  (70 K)
- Rapid cooldown
- Eliminates the need for liquid nitrogen

The Polycold PCC is a compact, high-performance cooling system that brings efficiency and reliability to your applications. As the next generation of Cryotiger® technology, PCC delivers proven, dependable cooling, and is designed to ensure repeatable performance and minimize maintenance costs. Its compact design and remote cold end give you a robust system with a small footprint. This low vibration heat removal system is capable of maintaining temperatures as low as  $-203^{\circ}\text{C}$  (70 Kelvin).

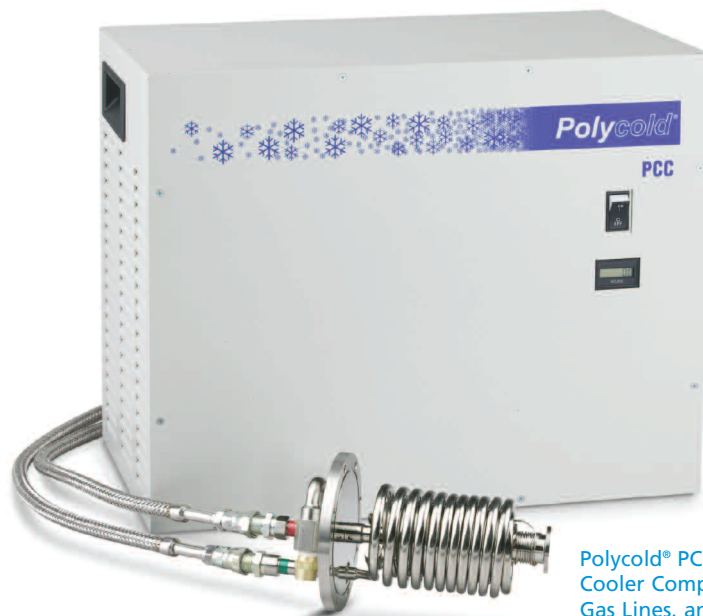
## *PCC Components*

**Cold End:** The rugged, low-vibration PCC cold end can be used in any orientation, and located remotely from the compressor. Available nickel plated or Mylar wrapped. For PT blends, options include standard or high performance.

**Compressor:** The closed cycle PCC compressor uses patented gas blends and innovative oil management for quiet and reliable performance in a small footprint. Electricity is the only utility required for operation.

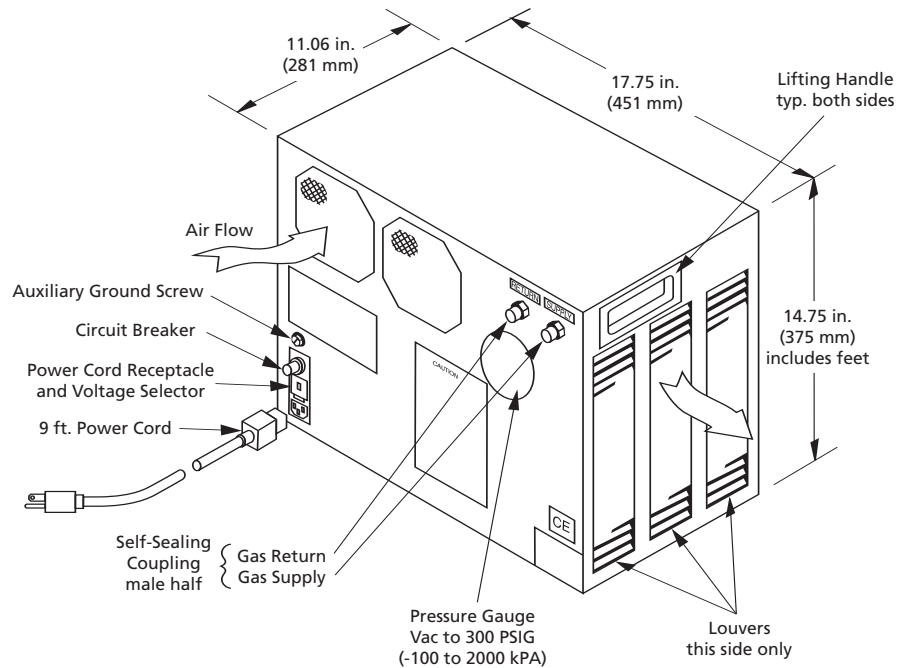
**Gas Lines:** Self-sealing couplings ensure quick and easy hook-up, and the compressor can be located up to 100 feet from the cold end. Refrigerant travels through the gas lines at room temperature.

**Refrigerant Blends:** Different patented mixed gas refrigerant blends tailor the temperature and cooling capacity for a wide variety of applications.



Polycold® PCC Compact  
Cooler Compressor,  
Gas Lines, and Cold End

## Compressor and Gas Lines



### Compressor

Weight	33.6 kg (74 lbs.)
Orientation	Base down required (level to within 10°)
Power requirement	Single phase, 50/60 Hz, 500 Watts nominal. External switch allows you to select 100, 120, 220, or 240 Volt operation.
Cooling	Air-cooled
Agency approvals	CE, NRTL, SEMI S2, SEMI F47

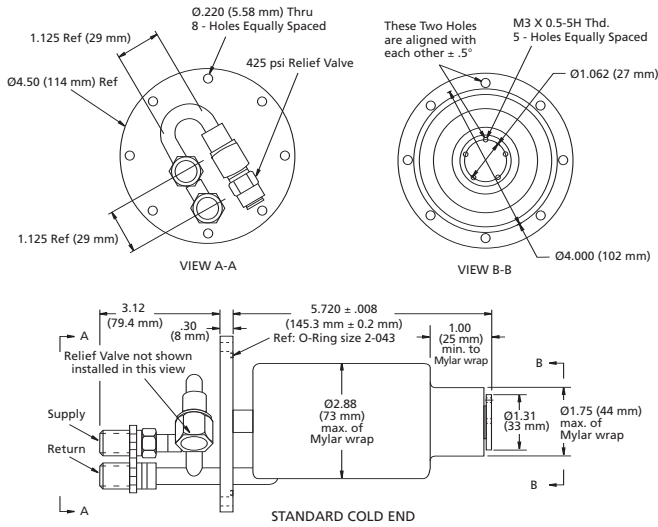
### Gas Lines

Construction	Braided stainless steel
Diameter	0.5 inch (12.9 mm) nominal
Lengths	5, 10, 25, or 50 ft. (1.5, 3.1, 7.6, or 15.2 m)
Minimum bend radius	4 in.(102 mm)
Compressor can be located up to 100 ft. from the cold end.	

### Accessories

Brooks provides a variety of accessories for your PCC system, including 90° adapters for gas lines, electrical line isolators, and line-to-line connectors.

### Standard Cold End Specifications



Weight	1.5 kg (3.2 lbs.)
Vacuum insulation requirement	≤ 10 <sup>-4</sup> torr
Bakeable to	100°C
Weight supported at the cold tip	≤ 1.4 kg (3.0 lbs)
Orientation	Any

#### Cooling Performance

##### NF blends\*

Cooldown Time (with no load):

NF-55: -56°C (217 K) in 8 minutes

Maximum cooling capacity for each gas blend:

NF-55: 48 Watts @ -56°C (217K)\*

Temperature Stability:

+/- 1.0 K. Performance with 10' Gas Lines.

\*NF indicates non-flammable gas.

##### PT blends

Cooldown Time (with no load):

PT-30: -144°C (129K) in 22 minutes

PT-16: -156°C (117K) in 26 minutes

PT-14: -177°C (96K) in 45 minutes

PT-13: -187°C (86K) in 61 minutes

Maximum cooling capacity for each gas blend:

PT-30: 29 Watts @ -144°C (129K)

PT-16: 23 Watts @ -156°C (117K)

PT-14: 10 Watts @ -177°C (96K)

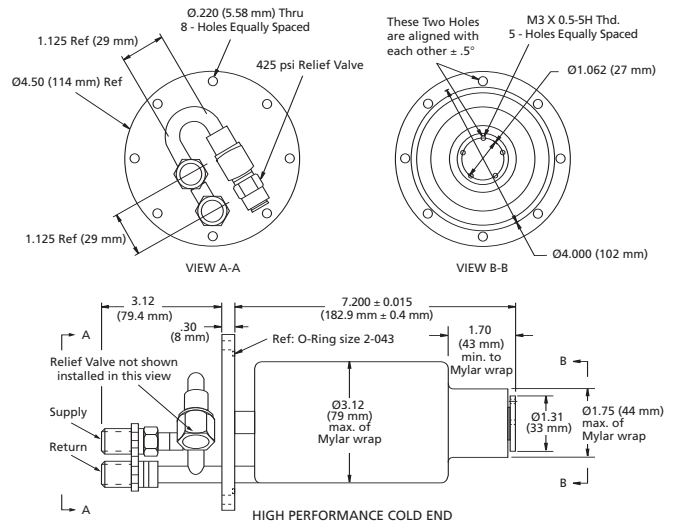
PT-13: 6 Watts @ -187°C (86K)

Temperature Stability

+/- 1.0 K. Performance with 10' Gas Lines.

Note: 50 Hz operation may derate cooling capacity.

### High Performance Cold End Specifications



Weight	1.8 kg (4.0 lbs.)
Vacuum insulation requirement	≤ 10 <sup>-4</sup> torr
Bakeable to	100°C
Weight supported at the cold tip	≤ 1.4 kg (3.0 lbs)
Orientation	Any

#### Cooling Performance

Cooldown Time (with no load):

PT-30: -128°C (145K) in 19 minutes

PT-16: -153°C (120K) in 25 minutes

PT-14: -166°C (107K) in 35 minutes

PT-13: -179°C (94K) in 54 minutes

Maximum cooling capacity for each gas blend:

PT-30: 32 Watts @ -128 °C (145K)

PT-16: 24 Watts @ -153°C (120K)

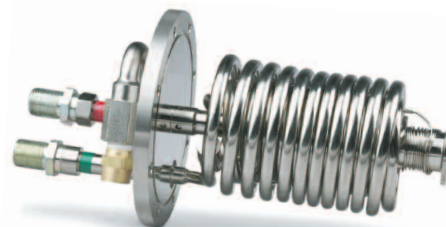
PT-14: 15 Watts @ -166°C (107K)

PT-13: 7 Watts @ -179°C (94K)

Temperature Stability

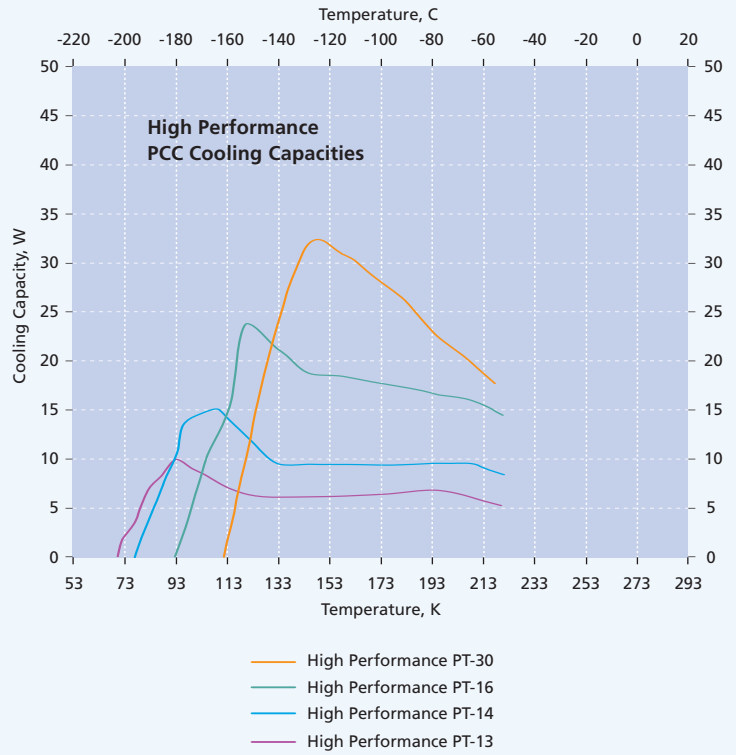
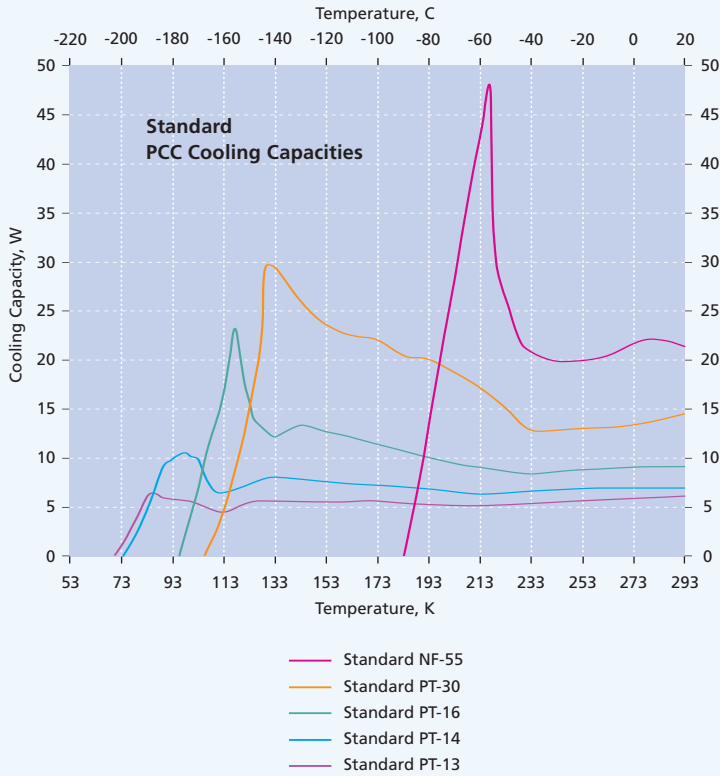
+/- 1.0 K. Performance with 10' Gas Lines.

Note: 50 Hz operation may derate cooling capacity.



Standard nickel-plated cold end

Performance



Applications

- |                                 |                          |                          |
|---------------------------------|--------------------------|--------------------------|
| High Resolution Digital Imaging | Scientific Research      | Materials Analysis       |
| Analytical Chemistry            | Water Vapor Cryotrapping | Transportation Security  |
| Life Sciences                   | Radiation Detection      | Semiconductor Inspection |
| Medical Diagnostics             | Astronomy                | Research and Development |

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