



The HT-1 is a unique vertically mounted Concentrating Solar Thermal Collector design, optimized to northern climates. It features high efficiency energy conversion, high temperature output and a built-in sun tracking system.

This system is ideal for space heating, domestic hot water, and high grade heat for agricultural and industrial process applications throughout the year.

The high grade heat capture capability makes the system a viable option for use in cooling and co-generation applications.

Applications:

- Producing high grade heat for domestic, agricultural and industrial applications, year-round.
- Producing high grade heat for solar cooling applications during cooling seasons.

System Description:

System Performance

- Energy conversion efficiency 55 to 40%* from +30 to -20°C outdoor ambient temperature, for a T_Panel_Out = 50°C. *Pending Certification
- 2.7 m² collector aperture area per collector
- Capable of 'high grade' heat (>90°C) with outdoor temperature below -30°C

Mounting Rack:

- Aluminum frame and racking with stainless steel fixing hardware
- Mounting on vertical (or sloped) surfaces, uses standard Super-Strut™ bracket system
- Mounting Rack 10 lb (5 kg) for two racks

Collector:

- 48" x 99.5" (1.22 m x 2.53 m), 30" (0.76 m) deep including mounting rack
- Light weight: 20 lb (9 kg) per collector, total system weight 30lb (14 kg) incl. rack
- Motor based motion control system

Absorber:

- Standard 1/2" (5/8" OD) copper tubing
- Solar absorptive coating
- Capable of sustained high temperature > 100°C (with non-water based working fluid) useful for solar cooling applications

Controller:

- Micro-Processor controlled with data logging capability
- Temperature sensor activation control and fail safe
- Motion control, algorithm self optimizing to installation location
- Pump control actuators

Peripheral Requirements:

- Heat Transfer Fluid:
 - Environmentally safe Propylene Glycol (food grade), for sub 95°C applications
- Circulation Pump:
 - Minimum 5 L/min at pump's maximum system height
 - Maximum operating temperature 115°C (240°F)
 - Limit maximum temperature difference between panel inlet to panel outlet to below 25°C (recommended)
- Heat Transfer Lines:
 - System interfaces to standard 1/2" (5/8" OD) copper tubing; Rigid copper or soft copper (5/8" OD) tubing (insulation recommended)
- Solar Storage Tank:
 - Minimum 80 US gal/270L, pre-heat storage tank, standard North American electric hot water tank (used only for storage)
 - 100 gal US/370L per collector panel (recommended) if used for multi-day storage with space heating; Optional: Insulated steel tank, insulated fibre reinforced concrete cistern or equivalent, fitted with heat exchanger
- Web services:
 - Remote monitoring service with monthly energy-gain notification, soft fail and maintenance monitoring available

Safety and Maintenance:

- Mirror performance is guaranteed for 10 years
- Maximum efficiency open mirror design system must not be exposed to flying or falling debris impacting mirrored surfaces
- Clean with distilled water and ethyl or isopropyl alcohol ph. of 7.2 +/- 0.5. Do not use tap water or water with dissolved minerals, salts or reactive chemicals
- Do not place combustible materials within 100" (2.5 m) of the system during daylight hours
- Avoid looking at image of sun in mirrored surface. Eye damage could occur

Other product considerations:

- Vertically mounted design allows for optimal heat collection in fall and winter
- Very light weight design requires no additional infrastructure or structural support. The system has "zero footprint". Panels can be installed on a surface one above another with sufficient spacing
- Sun tracking system rotates collector to optimize light collection throughout the day
- System automatically turns "OFF" when preset maximum temperature is reached
- System can be adequately sized for more consistent monthly heat collection
- Vertical design sheds water, snow, ice and debris
- Horizontal and angled surface mounting also viable

Technical System Block Diagram

