Sunward Solar Hot Water Technical Specifications

Each Sunward System includes the following:

- (2) Sunward Solar Collectors
- Sunward Pre-Plumbed Manifold
- Sunward Storage Tank
- Sunward External Heat Exchanger
- Sunward Pre-Wired Photovoltaic Panel
- Stainless steel Flex Connectors
- Ducts for concealing exterior micro-tubing
- Drain Valve Assembly
- Compression Fitting Kit
- USP Propylene Glycol
- Mounting hardware
  - o Roof mount option
  - o Ground mount options
    - —Sunward Solar Rack - metal frame
    - —Sunward Timber Frame
- Either:
  - o 50' pre-insulated external Micro-tubing burial kit & 50' internal Micro-tubing kit (for ground mount systems)
  - o 100' pre-insulatedMicro-tubing kit (for roof mount systems)

Sunward Solar Collectors:

- Collector size: 47-1/2” x 97-3/8” x 3-3/4”
- Collector surface area: 32.1 ft^2 (2.98 m^2)
- Collector weight: 96 lbs (43.5 kg)
- Collector aperture area: 30.0 ft^2 (2.78 m^2)
- Net collector aperture area: 60.0 ft2 (5.57 m^2)
- Collector capacity: 30 kBTU/day per collector on clear day per SRCC OG-100 rating
- Absorber plate: continuous copper tubing permanently metallurgically-bonded between two sheets of aluminum (no joints to leak or fail)
- Absorber material: copper (CDA 1220/0 alloy), aluminum (AA 1350/0 alloy)
- Absorber coating: semi-selective coating
- Collector heat transfer fluid capacity: 0.086 gallons (0.39 L)
- Solar glazing: 1/8" thick single-glazed, low-iron tempered glass, 89.5% transmittance
- Frame material: aluminum
- Gasket material: EPDM
- Thermal insulation: 1" thick fiberglass board
- Collector connector type: 3/8" compression fitting
- Operating temperature range: -51 F(-46 C) to 320 F (160 C)
- Certifications: SRCC OG-100
- 20 year limited warranty

Sunward External Heat Exchanger:

- External heat exchanger
  - o Shell and copper coil heat exchanger; 4 concentric coils of copper tubing for large surface area
- Heat transfer fluid pump capacity: 0.6 gem
- Heat exchanger size: 7-3/4" x 25" x 20" deep
- Pressure rating: tested to 300 psi on potable water side and 120 psi on collector side
- Heat transfer fluid: 40% propylene glycol and 60% distilled water
- Pump: 20 watt magnetic drive, brass body, vane-type, self-priming, positive displacement pump with high temperature protection
  - o Pump has a DC motor that is powered exclusively by the included pre-wired 20W Sunward PV Panel; no external electrical power required
  - o Built-in strainer
  - o All wetted parts are stainless steel, brass and carbon to eliminate corrosion
  - o Pump control sequence
    When the delta T between the collector and the heat exchanger is high, the pump runs slower to pull more heat from the collector. When the delta T is low, the pump runs faster.
- Linear Current Booster to maximize the power delivery of the PV module to the DC motor. When at peak irradiation, the PV module runs the motor at rated speed, at low light levels the Linear Current Booster transforms the voltage into current to allow the motor to start, and the motor runs at reduced speed to provide proportional control for the heat exchanger.
- Expansion reservoir in the heat exchanger
- System self-pressurizes using capillary action through the 3/8" Micro-Tubing. No external pump needed to prime the system.
- 10 year limited warranty

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Sunward Solar Hot Water Technical Specifications (cont.)

Sunward Storage Tank:

- Glass-lined storage tank
- Tank size: 62-1/2" tall x 25" OD, 80 gallon capacity
- (2) 3/4" ports
- Foam insulation
- Steel external jacket
- Pre-plumbed with dielectric nipples in all ports
- Includes T&P valve
- Pressure tested at factory
- 10 year limited warranty

Sunward PV Panel

- BP Solar SX320M - 20W nominal PV module
- Pre-wired and tested at our factor.
- Panel size: 16-3/4” x 20” x 2”
- Panel weight: 6.5lbs (2.95kg)
- Electrical specifications:
  - Current at Peak Power = 1.19A
  - Voltage at Peak Power = 16.8DCV
  - Warranted Minimum Power = 18.0W
  - Short Circuit Current = 1.9A
  - Open Circuit Voltage = 0.8DCV
- Output cables:
  - AWG# 18, 2 core ITC/PLTC; length - 4572mm
- Connector: Delphi Weatherpack

Pre-plumbed Manifold:

- Thermal mixing valve
- (2) Temperature gauges
- 3/4" PP Street 90
- 3/4" PP Tee
- (2) 3/4" PP male adapter
- 3/4" copper pipe x 2-1/4"
- 3/4" copper pipe x 8"
- Precisely factory assembled, fully pressure tested
- Requires only two cuts into the cold water inlet to connect

Stainless Steel Flex-Pipe and Coupling

- Allows easy connection to storage tank with no pipe cutting or sweating required.

Heat Transfer Fluid

- 40% high-purity, food-grade USP (United States Pharmacopeias) Propylene Glycol with corrosion inhibitors/60% distilled water
- System contains about 1 gallon (4L) of heat transfer fluid, plus approximately 3 quarts per 100 feet of tubing between the collectors and the heat exchanger.

Sunward Micro-Tubing

- 3/8" diameter ASTM B-280 copper tubing (transfers Glycol mixture between Sunward Solar Collectors and the Sunward Heat Exchanger)
- Small diameter tubing induces capillary action that forces air out, eliminating the need to prime the system
- Insulation: black foam insulation
  - Material: NBR & PVC
  - Operating temperatures: -40F to 221F (-40C to 105C)
  - Thermal conductivity @ 0C: 0.035 W/(m*K)
  - Permeability - steam diffusion resistance >4000
  - Tensile strength: 0.32 Mpa
  - Elongation @ break: 203%
  - Tear resistance: 1.59 kN/m
  - CFC-free, non-toxic, fire safe

Thermistor

- Electrical characteristics:
  - R25C=10K OHMS ±5%
  - NTC=-4.4%/C@ 25C, RT CURVE Z
  - Operating temperature: -40C TO 105C
- Leads:
  - #20 AWG PVC, black insulation
  - Stranded, 300V
- Connectors: Delphi Weatherpacks

Pre-Bundled Burial Kit includes:

- Conduit: 3", Hancor P/N 03400250H
- (2) 50' sections of pre-insulated 3/8" Micro-Tubing
- 75' of PV output cable
- 100' kits available