Custom Commercial

Solar Thermal Water Heating Systems

A. O. Smith Custom Commercial Solar Water Heating Systems

Building on our strength as the industry leader in providing innovative and energy efficient water heating solutions, A. O. Smith is proud to offer a full line of Custom Commercial Solar Thermal Water Heating Systems. By harvesting the free energy from the sun, available throughout the year, these highly efficient water heating systems can greatly reduce operating costs and carbon emissions. Each solar thermal system is custom designed to meet the customer's specific needs and application requirements.

The Time Is Right

A. O. Smith solar thermal water heating systems can help businesses, government agencies, utilities and institutions reach their goals to reduce carbon emissions, meet Renewable Portfolio Standards (RPS), comply with sustainability and efficiency requirements and attain LEED certification. The commercial solar thermal market is growing; Federal tax credits, accelerated depreciation, state and utility company incentives and Renewable Energy Credits (RECs) are in place throughout the United States. The time to install a solar thermal water heating system has never been better.

A Smart Investment

A. O. Smith solar thermal water heating systems are a smart investment. Reduced operating costs can immediately help your bottom line and provide long term relief from rising energy costs. Our durable, long-lasting solar thermal systems will provide a reliable source of hot water at a fraction of the operating costs for years to come.

The A. O. Smith Advantage:

- Complete systems with back-up or supplemental heat from electric heating elements, gas, boiler water, steam or other renewable energy sources.
- Solar preheat for existing hot water supply systems.
- Dedicated engineering resource for system sizing.
- Dedicated engineering design support - our engineering staff will work closely with architectural and engineering firms to meet specified requirements.
- System piping diagrams for storage tanks and collector arrays.
- Professional system sizing reports detailing solar contribution, collector area, energy consumption, energy savings, carbon offsets and more with tables and graphical charts that simplify data – provide to customers with proposals, quotations and during presentations.
- Energy metering to confirm system performance and validate solar contribution.

Financial Benefits:

- Energy costs for water heating reduced up to 70% or more.
- Complete systems qualify for a 30% federal tax credit of the total installed costs (no cap) through December 31, 2016.
- Substantial return on investment and system payback.
- 100% accelerated depreciation through 2011.
- Sound investment that reduces operating costs - provides a hedge against rising energy costs and inflation.
- State and utility company incentives and rebates.
- Renewable Energy Credits (RECs).
- Power Purchase Agreements (PPAs).
- Visit www.dsireusa.org/solar for more information.

Applications

- Domestic hot water.
- Space heating.
- Process water.
- Pool heating.

Installations:

- Commercial and industrial facilities.
- Government and military buildings.
- Hospitals and heath care facilities.
- Hotels and resorts.
- Universities and schools.
- Manufacturing facilities.
- Cafeterias and restaurants.

System Components:

- Medium to large volume solar storage tanks.
- Integrated solar commercial pump stations.
- Chromagen™ solar thermal flat plate collectors.

Solar Commercial Storage Tanks

Large volume solar storage tanks from A. O. Smith are designed for storing potable water. These storage tanks are fitted with additional openings to suit the specific needs of solar thermal, commercial heat pump, and other renewable energy heat sources.

These tanks are available as pre-configured Specialty Solar Tanks and as Custom Solar Tanks built to specified application requirements.

Specialty Solar Tanks

- Vertical tanks from 140 to 2,000 gallons and horizontal tanks from 200 to 1,000 gallons. These heavy duty storage tanks have been designed for new construction and retrofit applications.
- All tanks are ASME constructed at 160 psi working pressure. Greater or lesser working pressures also available.
- Specialty Solar Tanks feature A. O. Smith PermaGlas® coating that provides superior protection against corrosion.
- Entire tank is surrounded with 3 inches of high density fiberglass insulation to reduce costly heat loss - R 12.5 insulation value.
- Heavy gauge steel jackets with high quality powder coat paint.
- Factory-installed magnesium anode rods.
- Factory-installed upper and lower temperature sensor wells with Pt1000 type sensors and internal wiring.

Custom Solar Tank Options

- Glasslined tanks.
- Cement lined tanks.
- Stainless steel tanks.
- Manhole or handholes are optional on glasslined tanks but are included on cement lined tanks.
- Customized tanks up to 12,500 gallons with specified tank dimensions, tank openings and tank opening locations.
- Outdoor models - entire tank is sprayed with high-density polyurethane foam insulation that forms a watertight jacket that is approved for outdoor use.
- Additional insulation - provides R16 insulation value.

Supplemental / Backup Heat Sources:

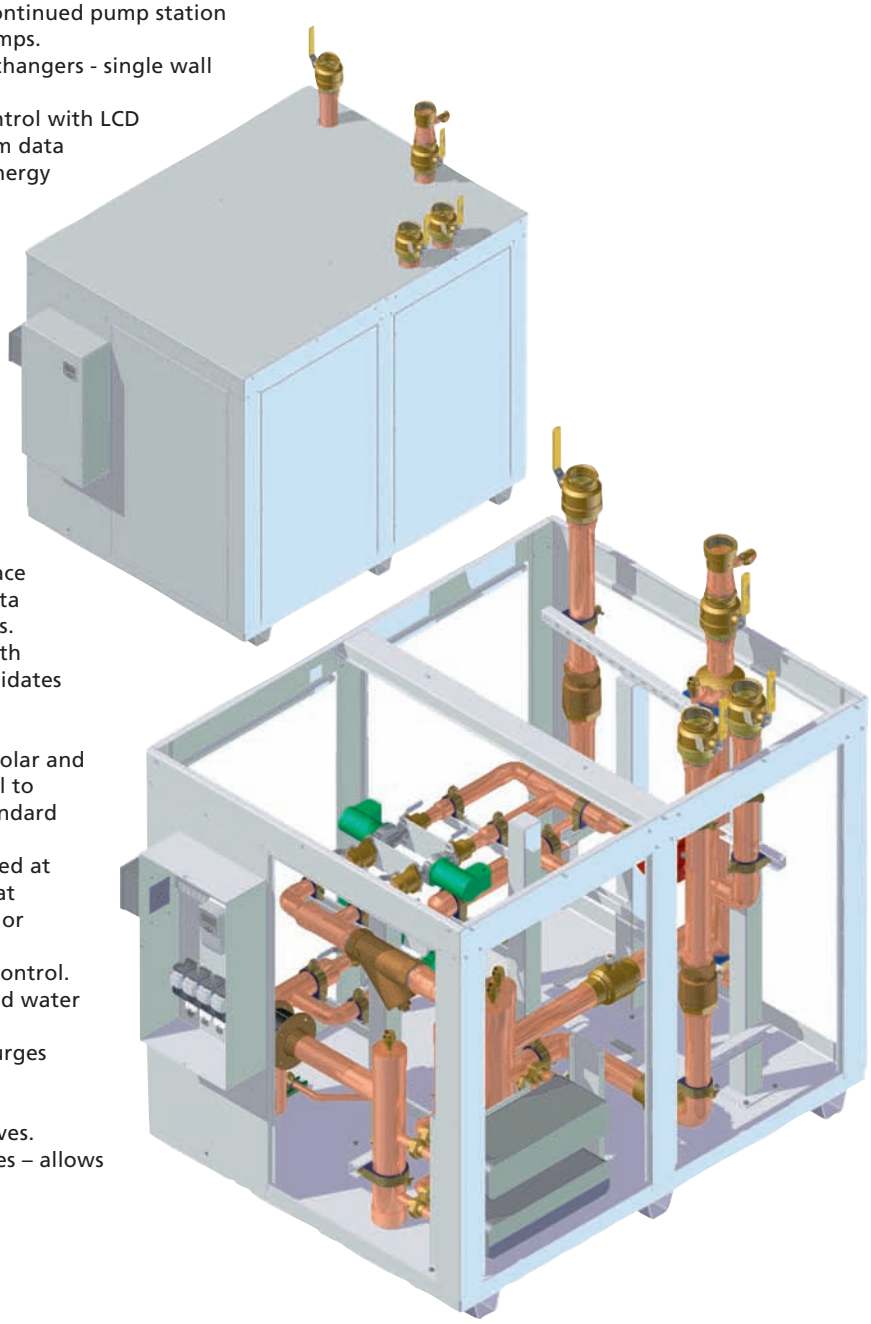
- Electric heating element packages - standard voltages 208/240 VAC (single/three phase), 480 VAC three phase. Advanced electronic controller, modulating step control, low water cutoffs.
- Tank heaters - flange mounted removable single/double wall copper tube heat exchangers for backup heating from low pressure steam or boiler water.
- Tank heaters - flange mounted removable single/double wall copper tube heat exchangers for supplemental heat from alternate heat sources such as geo-thermal, air or water source heat pumps.

Integrated Solar Commercial Pump Stations

A. O. Smith integrated commercial solar pump stations maximize performance, savings, and serviceability. All-in-one factory assembled heat transfer station simplifies system design and sizing, saves space and reduces installation costs. Five pump stations available with single wall or double wall heat exchangers capable of transferring 160,000 to 800,000 Btu/hr of heat energy captured from the sun. Pump stations can be combined to supply an unlimited number of collectors.

Features

- Factory assembled fully integrated pump stations – consistent intuitive design.
- Redundant solar and water loop circulation pumps - self-lubricating pumps with isolation flanges - allows continued pump station operation while servicing individual pumps.
- Stainless steel (316L) flat plate heat exchangers - single wall or double wall.
- Fully programmable electronic solar control with LCD display that monitors and records system data with graphical view for temperature, energy and other operational data.
- Solar control continually monitors system operation and provides alerts for system errors such as shorted or open temperature sensors, pump failure or loss of flow.
- SD memory card slot on solar control - saves and transfers configuration settings from one pump station to another - provides permanent storage for energy data.
- Web module for online monitoring via Internet or local intranets.
- Standard energy metering via onboard solar control with factory installed surface mount temperature sensors - energy data logging, tracks performance and savings.
- Optional MID certified energy meter with well mounted temperature sensors - validates solar contribution.
- Pulse type electronic flow meter.
- Surface mount temperature sensors in solar and water loop - monitored by solar control to start/stop circulation pumps and for standard energy metering.
- Temperature sensor wells (4) are provided at solar and water loop connections to heat exchangers - for optional energy meter or field supplied temperature sensors.
- Fluid balancing valves for precise flow control.
- Full port isolation ball valves at solar and water loop connections.
- Air stripper with automatic air vent - purges air from solar loop.
- Brass body wye strainer in water loop.
- Solar and water loop pressure relief valves.
- Removable access panels on all four sides – allows for ease of servicing.

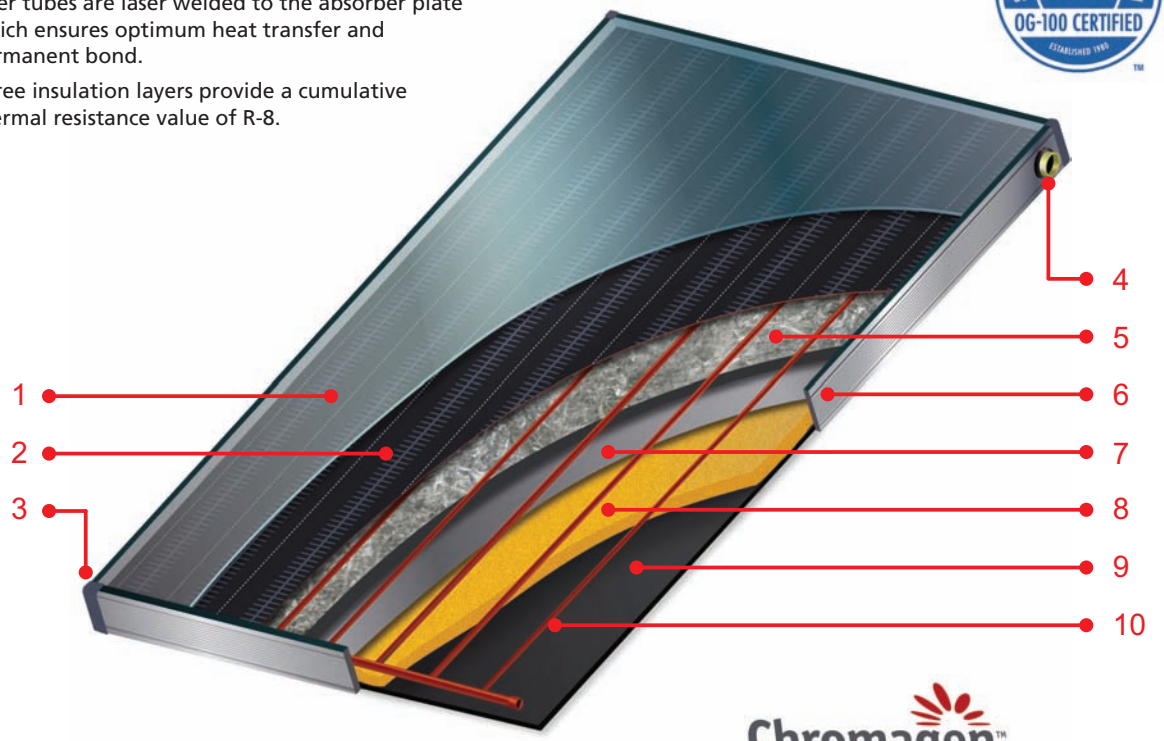


Flat Plate Solar Thermal Collectors

All Solar Collectors Are Not Created Equal

Backed by over 40 years of expertise, Chromagen™ has fine-tuned the design and manufacture of solar collectors to an art. Collectors are assembled using the highest quality materials and advanced techniques, which result in highly efficient, durable products you can depend on for years to come.

- Optimal heat absorption and efficiency, suitable for all installations and regions.
- Riser tubes are laser welded to the absorber plate which ensures optimum heat transfer and permanent bond.
- Three insulation layers provide a cumulative thermal resistance value of R-8.



1. Low-iron patterned and tempered glazing provides superior strength, anti-glare surface and 91% solar transmittance.

2. Aluminum absorber plate with spectrally selective black coating provides more than 90% solar absorption and less than 40% IR emission for high performance even in cooler climates.

3. Rugged nylon glass fiber moldings on all four corners protect collectors and adjacent property from damage during transport and installation.

4. 1-1/8 inch outside diameter (O.D.) copper sweat inlet/outlet connections.

5. Glass wool insulation layer.

6. Black anodized extruded aluminum casing - interlocking construction assembly - requires no fasteners that loosen over time and allow moisture infiltration.

7. Integrated aluminum foil insulation barrier.

8. Injected rigid Polyurethane foam insulation layer.

9. Durable black Polypropylene backsheet - resists punctures during transport and installation, resists corrosion for the life of the collectors.

10. Type M copper risers 5/8 inch and manifolds 1-1/8 inch (O.D) are brazed together in a parallel tube configuration - ensuring optimal flow and a low pressure drop. Collectors may be installed in portrait or landscape orientation.

Horizontal Specialty Solar Tanks

MODEL	NOMINAL VOLUME (gallons)	GLASSLINED DRY WEIGHT (lbs.)	HEIGHT (inches)	DEPTH (inches)	LENGTH (inches)
SJH-200	200	1020	41	36	77
SJH-250	250	1082	41	36	90
SJH-350	350	1232	47	42	93
SJH-400	400	1402	47	42	99
SJH-500	500	2270	59	54	79
SJH-750	750	2970	59	54	111
SJH-1000	1000	3751	59	54	143

Vertical Specialty Solar Tanks

MODEL	NOMINAL VOLUME (gallons)	GLASSLINED DRY WEIGHT (lbs.)	WIDTH (inches)	HEIGHT (inches)
SJV-140	140	613	30	86
SJV-200	200	749	36	82
SJV-250	250	811	36	95
SJV-300T	300	898	36	110
SJV-300S	300	857	42	82
SJV-350	350	942	42	97
SJV-400	400	1436	42	104
SJV-450	450	1565	42	118
SJV-500T	500	1682	42	133
SJV-500S	500	1714	48	99
SJV-600	600	1820	48	114
SJV-700	700	1911	48	130
SJV-800	800	2974	54	120
SJV-900	900	3208	54	128
SJV-1000T	1000	3697	54	148
SJV-1000S	1000	3947	*66	99
SJV-1500	1500	4456	*60	164
SJV-2000T	2000	6035	*66	176
SJV-2000S	2000	5952	*78	131

Vertical Specialty Solar Tank Notes:

Four vertical tank models are available in short and tall sizes. The S and T designators at the end of the model numbers are used to identify these models.

** These vertical tanks will have rectangular jackets when manufactured for indoor use. All other models will have round jackets.*

Solar Commercial Pump Stations

PART NUMBER	HEAT EXCHANGER	DRY WEIGHT (lbs.)	CAPACITY (gallons)	HEIGHT (inches)	WIDTH (inches)	LENGTH (inches)	MAX COLLECTOR APERTURE AREA (FT^2)	MAX NUMBER CR-110-AP COLLECTORS (3.5' X 7')	MAX NUMBER CR-130-AP COLLECTORS (4' X 8')	MAX NUMBER CR-140-AP COLLECTORS (4' X 10')	ENERGY RATING BTU/HR
9008121005	Single Wall	650	4	57	52 3/4	52 3/4	741	32	26	20	160,000
9008122005	Double Wall										
9008123005	Single Wall	675	6	62	52 3/4	52 3/4	1,481	64	50	40	320,000
9008124005	Double Wall										
9008125005	Single Wall	800	9	63 1/4	52 3/4	52 3/4	2,222	96	76	60	480,000
9008126005	Double Wall										
9008127005	Single Wall	1455	20	78 1/2	54 3/4	78 1/2	2,962	128	100	80	640,000
9008128005	Double Wall										
9008129005	Single Wall	1465	21	78 1/2	54 3/4	78 1/2	3,703	160	126	100	800,000
9008130005	Double Wall										

Flat Plate Solar Thermal Collectors - Bulk

PART NUMBER	HI CUBE TRAILER LOAD FACTOR	COLLECTOR SIZE (feet)	MODEL NUMBER	ABSORBER PLATE	MANIFOLD TUBE DIAMETER O. D. (inches)	RISER TUBE DIAMETER (inches)	THERMAL PERFORMANCE (SRCC Cat 3 Clear Day)	COLLECTORS PER PALLET	APPROX SHIPPING WEIGHT (lbs.)
9007468005	3.57	3.5' x 7'	CR-110-AP	Aluminum with Black Selective Coating	1"	5/8"	25,000 Btu/day	11	1003
9007613005	5.56	4' x 8'	CR-130-AP	Aluminum with Black Selective Coating	1"	5/8"	32,000 Btu/day	7	864
9007614005	6.67	4' x 10'	CR-140-AP	Aluminum with Black Selective Coating	1"	5/8"	40,000 Btu/day	7	1087

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