

**PLUMBING APPLICATION**

**PROPERTY ADDRESS**

Town or Plantation 238 Brackett St  
 Street or Subdivision Lot # Peaks Island

**PROPERTY OWNER(S) NAME**

Last: Fischer First: MARTIN

Applicant Name: Revision Energy

Mailing Address of Owner/Applicant (if Different) 142 Presumpscot St  
 PORTLAND, ME 04103

**Owner/Applicant Statement**

I certify that the information submitted is correct to the best of my knowledge and understand that any falsification is reason for the Local Plumbing Inspector(s) to deny a permit.

[Signature] Signature of Owner/Applicant      10/4/2011 Date

**Caution: Permit Required**

Plumbing shall not be installed until a Permit is attached here by the Local Plumbing Inspector. The Permit shall authorize the owner or installer to install the plumbing in accordance with the application and the Maine Plumbing rules.

Map \_\_\_\_\_ Lot \_\_\_\_\_

**Caution: Inspection Required**

I have inspected the installation authorized above and found it to be in compliance with the Maine Plumbing Rules

\_\_\_\_\_  
 Local Plumbing Inspector Signature      Date of Approval

**PERMIT INFORMATION**

**This Application is for**

- 1.  NEW PLUMBING
- 2.  RELOCATED PLUMBING

**Type of Structure to be Served**

- 1.  SINGLE FAMILY RESIDENCE
- 2.  MODULAR OR MOBILE HOME
- 3.  MULTIPLE FAMILY DWELLING
- 4.  OTHER-SPECIFY \_\_\_\_\_

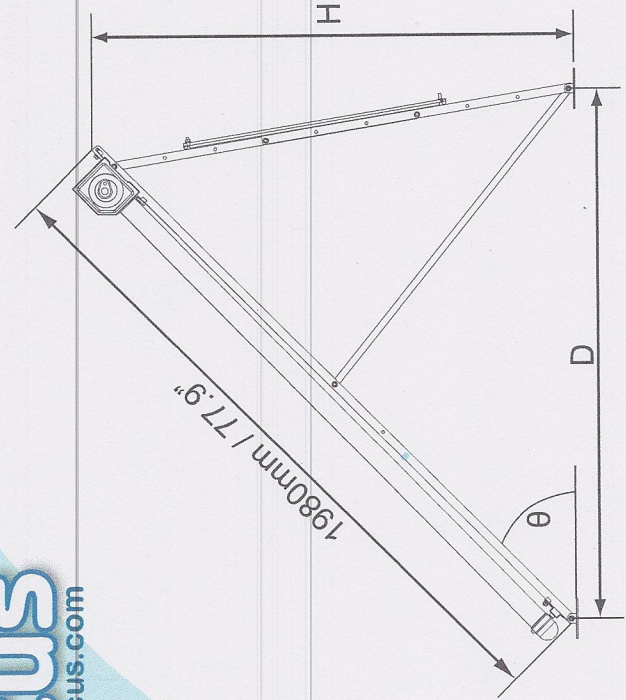
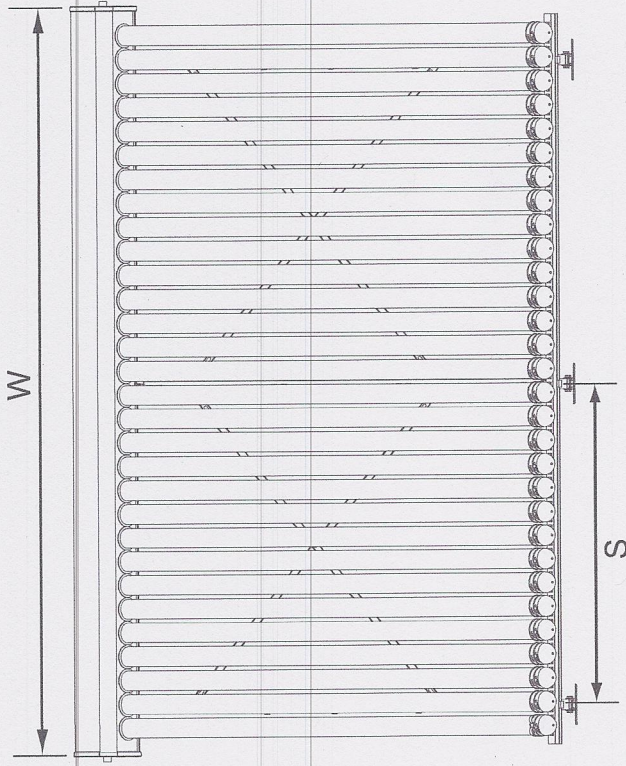
**Plumbing to be installed by:**

- 1.  MASTER PLUMBER
- 2.  OIL BURNERMAN
- 3.  MFGD HOUSING DEALER / MECHANIC
- 4.  PUBLIC UTILITY EMPLOYEE
- 5.  PROPERTY OWNER

LICENSE # 027051

Hook-Up & Piping Relocation Maximum of 1 Hook-Up	Column 2 Number Type of Fixture	Column 1 Number Type of Fixture
<input type="checkbox"/> HOOK-UP: to public sewer by those cases where the connection is not regulated and inspected by the local sanitary district.	<input type="checkbox"/> Hosebib / Sillcock	<input type="checkbox"/> Bathtub (and Shower)
<input type="checkbox"/> HOOK-UP: to an existing subsurface wastewater disposal system	<input type="checkbox"/> Floor Drain	<input type="checkbox"/> Shower (separate)
<input type="checkbox"/> PIPING RELOCATION: of sanitary lines, drains, and piping without new fixtures.	<input type="checkbox"/> Urinal	<input type="checkbox"/> Sink
	<input type="checkbox"/> Drinking Fountain	<input type="checkbox"/> Wash Basin
	<input type="checkbox"/> Indirect Waste	<input type="checkbox"/> Water Closet (Toilet)
	<input type="checkbox"/> Water Treatment Softener, Filter, Etc.	<input type="checkbox"/> Clothes Washer
	<input type="checkbox"/> Grease / Oil Separator	<input type="checkbox"/> Dish Washer
	<input type="checkbox"/> Roof Drain	<input type="checkbox"/> Garbage Disposal
	<input type="checkbox"/> Bidet	<input type="checkbox"/> Laundry Tub
	<input type="checkbox"/> Other: _____	<input type="checkbox"/> Water Heater
	<input type="checkbox"/> Fixtures (Subtotal) Column 2	<input type="checkbox"/> Fixtures (Subtotal) Column 1
		<input type="checkbox"/> Fixtures (Subtotal) Column 2
<b>OR</b>		<b>TOTAL FIXTURES</b>
<input type="checkbox"/> TRANSFER FEE (\$6.00)		<input type="checkbox"/> Fixture Fee
		<input type="checkbox"/> Transfer Fee
	<b>SEE PERMIT FEE SCHEDULE FOR CALCULATING FEE</b>	<input type="checkbox"/> Hook-Up & Relocation Fee
		<b>40</b> <b>PERMIT FEE (TOTAL)</b>
	<input type="checkbox"/> Owner <input type="checkbox"/> Town Copy <input type="checkbox"/> State Copy	

# Apricus Solar Collector Gross Dimensions



Angle	Type	D	H
52°	High Angle (Round Foot)	1406mm / 55.4"	1539mm / 60.6"
45°		1565mm / 61.6"	1389mm / 54.7"
38°		1688mm / 66.5"	1231mm / 48.5"
33°		1792mm / 70.6"	1074mm / 42.3"
46°	High Angle (Roof Track)	1900mm / 74.8"	1436mm / 56.5"
42°		1900mm / 74.8"	1315mm / 51.8"
37°		1900mm / 74.8"	1186mm / 46.7"
33°	1900mm / 74.8"	1051mm / 41.4"	
27°	Mid Angle (Round Feet) *	Variable	~ 911mm / 35.9"
27°	Mid Angle (Roof Track)	1900mm / 74.8"	911mm / 35.9"
13°	Low Angle (Round Feet) *	Variable	~ 447mm / 17.6"
13°	Low Angle (Roof Track)	1900mm / 74.8"	447mm / 17.6"

\* Low and Mid angle frame kits do not have a diagonal brace. When using round feet the rear legs can be freely positioned, and therefore the angle and height are slightly variable.

Size	S	W
10 tubes*	490mm / 19.29"	796mm / 31.3"
20 tubes*	1190mm / 46.85"	1496mm / 58.8"
22 tubes	665mm / 26.18"	1636mm / 64.4"
30 tubes	945mm / 37.2"	2196mm / 86.4"

\* 10 & 20 tube collectors only have 2 sets of legs

**Notes:**

1. The frame should be aligned with the roof rafters where possible.
2. The front tracks can be adjusted left and right slightly to match roof structure
3. When possible position the front tracks behind tubes so they are hidden
4. Always refer the the installation manual regarding mounting guidelines, in particular regarding mounting strength and wind loading issues.
5. Seek engineer approval for non standard installations, or if at all in doubt of mounting strength or safety.

# THE POWER OF THE SUN

## Storage Tanks for Solar Applications

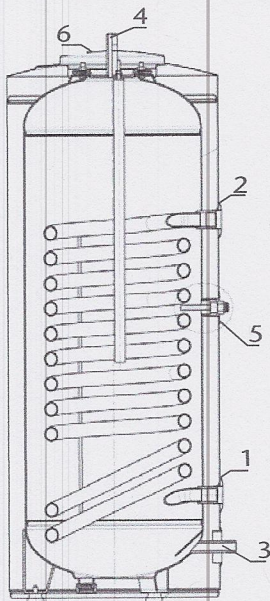
### Single Heat Exchanger Models



### Technical Data

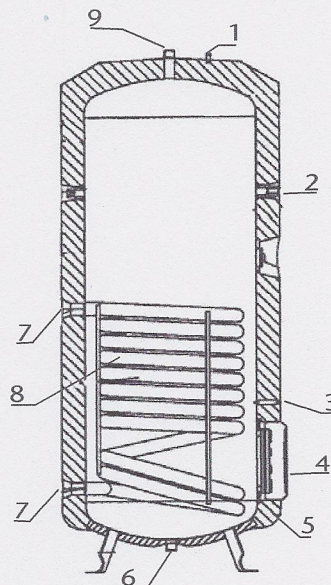
Type		SB 150 S	SB 200 S	SBB 300 S	SBB 400 S
<b>Contents</b>					
Storage capacity	Gal / ltr	39.0 / 147.63	52 / 196.84	80.6 / 305	108.6 / 411
Volume of heat exchanger, top	Gal / ltr	NA	NA	NA	NA
Volume of heat exchanger, bottom	Gal / ltr	1.9 / 7.2	2.7 / 9.1	2.7 / 10.1	2.9 / 11.3
<b>Pressure</b>					
Working pressure	PSI / bar	150 / 10	150 / 10	150 / 10	150 / 10
Tested to pressure	PSI / bar	217 / 15	217 / 15	217 / 15	217 / 15
Max. pressure of boiler loop	PSI / bar	150 / 10	150 / 10	150 / 10	150 / 10
<b>Temperature</b>					
Max. temperature solar loop	°F / °C	203 / 95	203 / 95	203 / 95	203 / 95
Max. temperature of boiler loop	°F / °C	203 / 95	203 / 95	203 / 95	203 / 95
<b>Heat exchanger</b>					
Surface area heat exchanger top	sq. inch / m <sup>2</sup>	NA	NA	NA	NA
Surface area heat exchanger bottom	sq. inch / m <sup>2</sup>	1742	2059	2325 / 1.5	2635 / 1.7
<b>Weights</b>					
Tank weight empty	lb. / kg	190 / 86.18	226 / 102.5	292 / 133	371 / 169
Tank weight full	lb. / kg	523 / 237.2	658 / 298.4	988 / 448	1304 / 591
<b>Other</b>					
Standby losses in 24 hours	BTU / kWh	6500 / 1.9	4434 / 1.3	6500 / 1.9	7500 / 2.2
Cold/hot water connection		3/4" Male NPT		for 1" copper pipe with adapters, provided with unit	
<b>Dimensions</b>					
Height with insulation	in. / mm	50.5 /	62.75 /	66.1 / 1679	72.7 / 1848
Width with insulation	in. / mm	20.5 /	20.5 /	27.55 / 700	29.52 / 750

### SB 150 S & SB 200 S models



- 1 Heat exchanger out
- 2 Heat exchanger in
- 3 Cold water inlet
- 4 Hot water outlet
- 5 Well for thermostat
- 6 T & P valve

### SBB 300 S & SBB 400 S models



- 1 Sacrificial anode indicator
- 2 Thermometer
- 3 Well for temperature sensor (solar)
- 4 Clean-out port
- 5 Foam insulation
- 6 Cold water inlet
- 7 Heat exchanger ports (solar)
- 8 Exchanger coil (solar)
- 9 Hot water outlet

Note: heat exchangers are steel with porcelain enamel coating.

# Marathon® Thermal Storage Tanks



Available in 50, 85 and 105 Gallon Models; 2 Port and 3 Port Configurations

▶ Lifetime Limited Tank Warranty\* ▶ 6-Year Limited Parts Warranty\*



### Designed for Alternative Energy Applications

- Specifically designed for installation as a thermal storage tank
- Backup electrical element provides 40 gallons or more of heated water
- Large water connections for lower pressure drop

### Built to Last!

- Seamless, blow-molded, polybutene tank – impervious to rust and corrosion
- Titanium sheath elements for superior resistance to lime build-up
- Multiple layers of filament wound fiberglass give the tank unmatched strength
- Tough molded polyethylene outer shell resists dents and scratches

### Designed for Easy installation

- Water port fittings located at front of storage tank for convenient access
- Full port, full flow brass drain valve for fast draining
- Factory installed temperature and pressure relief valve and vacuum relief valve

### Additional features

- Thermally fused element provides protection against “dry-firing”
- Bowl shaped bottom allows for complete sediment removal
- Recessed drain valve is out of the way of brooms and scrubbers

\*See Warranty Certificate for complete details.



DESCRIPTION		FEATURES	ROUGHING IN DIMENSIONS (SHOWN IN INCHES)						
T Y P E	GAL. CAP.	MODEL NUMBER †	ELEMENT WATTAGE	TANK HEIGHT A	HEIGHT TO WATER CONN. B	DIAMETER C	HEIGHT TO LOWER PORT D	HEIGHT TO UPPER PORT E	APPROX. SHIP WT. (LBS.)
T A L L	50	MTS50200	N/A	62-3/4	66-3/4	23-1/2	13-1/2	46	100
	85	MTS85200	N/A	66-1/4	70-1/4	28-1/4	14-1/2	49-1/2	134
	105	MTS105200	N/A	66-3/4	70-3/4	30-1/4	15	50	152
	85	MTS85245	4500	66-1/4	70-1/4	28-1/4	14-1/2	N/A	134
	105	MTS105245	4500	66-3/4	70-3/4	30-1/4	15	N/A	152
	85	MTS85345	4500	66-1/4	70-1/4	28-1/4	14-1/2	26-1/2	134
	105	MTS105345	4500	66-3/4	70-3/4	30-1/4	15	27-1/2	152

†Canadian certified models have different model numbers than U.S. models. Add a “C” before the model number (e.g., CMTS85245) when ordering.

‡Canadian certified models are not available on thermal storage tanks without backup elements (e.g., MTS50200, MTS85200, MTS105200)

- Storage tanks furnished with elements are standard 240 volt AC.
- Maximum test pressure: 300 PSI
- Maximum working pressure: 150 PSI
- Maximum water temperature: 180° F

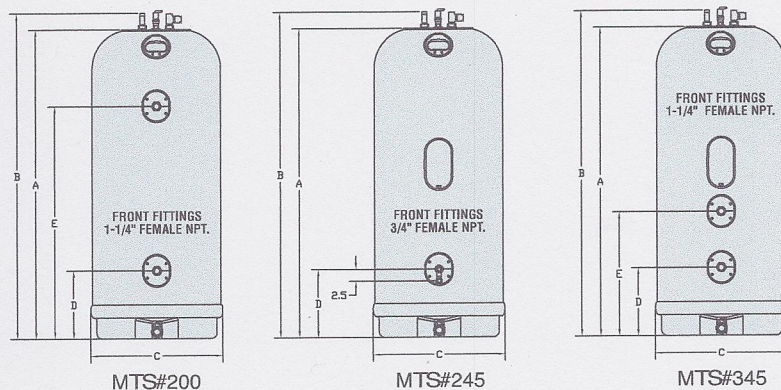
**Your Marathon is warranted not to leak for as long as you own your home!\***

Rheem offers this no-leak promise because of the superior, non-metallic tank construction of the Marathon.

The unit utilizes a seamless blow molded inner tank with a structural fiberglass shell for maximum strength.

Superior structural performance with high efficiency ... for a lifetime!\*

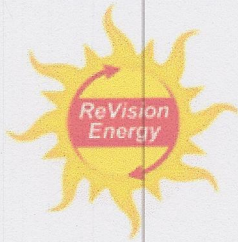
\*See Warranty Information Certificate at your dealer for complete details.



- ALL TOP FITTINGS 3/4" FEMALE NPT.
- TOP FITTINGS SPACED 5-3/4" APART.

In keeping with its policy of continuous progress and product improvement, Rheem reserves the right to make changes without notice.

Rheem Water Heaters • 101 Bell Road • Montgomery, Alabama 36117-4305 • www.rheem.com  
 Water Heater Innovations, Inc. • 3107 Sibley Memorial Highway, Eagan, MN 55121 • www.marathonheaters.com  
 Rheem Canada Ltd./Ltée • 125 Edgeware Road, Unit 1 • Brampton, Ontario L6Y 0P5



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## Solar Domestic Hot Water System with Supplemental Space Heating

Client: Martin Fischer  
 Address: 238 Brackett Ave., Peaks Island, ME 04108-1261  
 Date: 6 September 2011



**Collector location**  
 (front and rear of roof)

**Roof Orientation:**  
 170 degrees  
 (south)

**Roof Pitch:**  
 4/12  
 (18 degree angle)

**Roof material:**  
 Asphalt shingle

### Project Summary

System	Performance	Cost	Incentives	Net Cost
120-tube Apricus solar hot water collector array with 160-gallon solar storage tank & 75-gallon tank with electric backup.	<ul style="list-style-type: none"> <li>Produce more than 32,850,000 BTUs of clean, renewable heat energy annually.</li> <li>Offset more than 10,000 lbs. of CO2 annually. (~425 gallons of oil per year.)</li> </ul>	\$22,750 installed	-(\$6,825) Fed Tax Credit  -(\$1,000) State Rebate	\$14,925

### System Overview

Based on an evaluation of your household domestic hot water and heat demand, and near-ideal rooftop solar gain, ReVision Energy proposes a closed loop antifreeze solar hot water

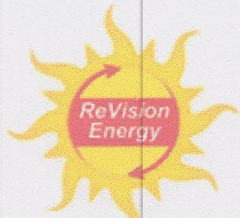
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system utilizing an Apricus 120-tube collector array, a Stiebel Eltron 160-gallon dual coil solar storage tank, a Marathon 75-gallon tank with integral electric element and a pre-engineered Flowstar solar pump station. The system is designed for primary solar domestic hot water heating and as a supplemental space heating system supplying low temperature (~120F) hot water to the radiant and baseboard zones. The system will consists of a large dual coil solar storage tank with a smaller electric tank for backup. On a good sunny day, the solar system will produce a 70-90 degree temperature rise in the tank. Energy stored in the solar tank tanks can then be used either to heat the space or to preheat the domestic hot water tank. In the summer, the solar contribution will be more than sufficient to meet all of your domestic hot water needs. In the winter, the electric tank's element will help maintain the domestic hot water at a comfortable temperature, while allowing the solar tank to be used mostly for space heating (i.e. boiler shut-off.)

### Major Components

- (4) 30-tube evacuated tube collector arrays ([www.apricus.com](http://www.apricus.com))
- Super insulated 160 gallon Stiebel Eltron solar storage tank with top & bottom heat exchange coils ([www.stiebel-eltron-usa.com](http://www.stiebel-eltron-usa.com))
- Marathon 75-gallon tank with electric backup element, and 4" insulation jacket
- Stiebel Eltron Flowstar solar pump station
- 40% Dow frost HD non-inhibited, break down resistant antifreeze (<http://www.dow.com/heattrans/family/dowfrhd/>)
- Stiebel Eltron SOM 7 Delta T controller
- (2) Taco 501 relays for independent pump control
- (1) Grundfos superbute pump and thermostat for separate second zone
- Tekmar 256 control for solar space heating and oil boiler integration
- Intellicon HW+ smart burn control



At left is a 120-tube solar hot water collector array installed by ReVision Energy on a passive solar house in Belfast, ME. The system is used to provide domestic hot water and radiant space heating.

We are proposing a similar installation for your home, except the array will reside on the front roof and rear roofs (reverse mount).

Apricus hot water collectors are adept at producing heat even as temperatures drop below 40 degrees F.

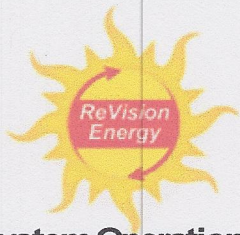
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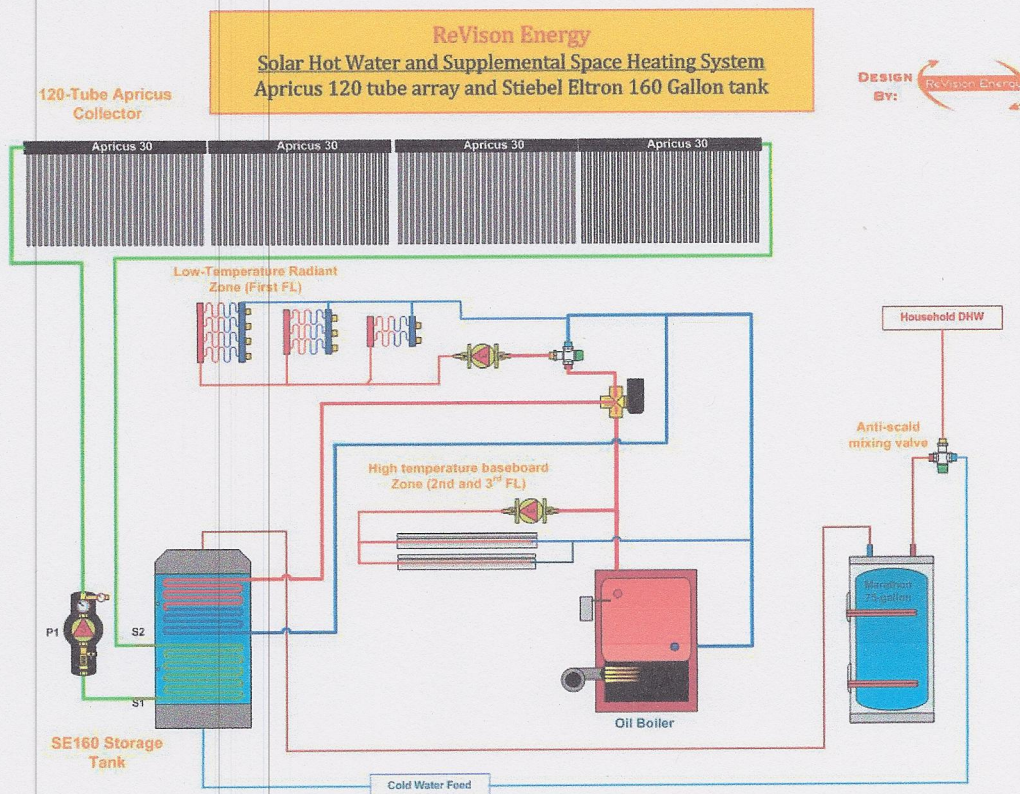


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### System Operation

The collectors will be rack mounted on the south-facing rooftop of the house on a stainless steel elevated frame. The solar storage and backup tanks will be located in the basement adjacent the oil boiler, with the dual coil tank plumbed in a 'preheat' configuration to the primary domestic tank (marathon with electric element). Whenever the rooftop collectors are warmer than the water in the bottom of the storage tank, a differential temperature controller will automatically activate the solar circulating pump. Sun-heated antifreeze will be pumped down from the rooftop collectors and through the heat exchange coil located in the bottom of the solar tank. Through the heat exchange coils, the heat from the sun will warm the water in the tank and provide most of your household's domestic hot water for showering, laundering, dishwashing, etc. In addition, when the large solar tank has been warmed sufficiently, the system will also provide space heating to the radiant floor zone. When the solar radiant zone thermostat calls for heat, a circulator pump will be turned on to circulate water through the upper coil of the tank and out to the radiant loop. In this way, the solar system will contribute to reducing the fossil fuel load of both the domestic hot water and the space heating system. Backup for the domestic hot water heating will rarely be required, but when it is, it is provided by the integrated electric element in the primary solar tank. Backup for space heat will be provided by the oil boiler.

### Schematic Diagram of System



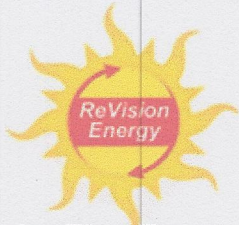
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### Solar Pipe Run

To form the closed solar heating loop, two 3/4" inch copper pipes with foam insulation will be installed between the collectors and storage tanks. For your project, the pipes will penetrate the upper roof, and travel down along the chase currently used by the heating distribution piping. In the basement, piping will travel across the ceiling to the main basement and over to the storage tanks.

### Warranty

ReVision Energy provides a 1-year warranty on all labor and services the manufacturers' warranty of the various components.

### Price includes the following:

- All materials necessary to mount and plumb the solar hot water system.
- All materials necessary to mount and plumb the electric backup tank
- All necessary licenses and certifications for a code-compliant installation.
- All labor required for installation.
- All Glycol piping
- Caleffi series-521 anti scald mixing valve assembly
- Controller, pump, fast fill/backflow preventer, expansion tank, PRV and other misc parts required to connect the top coil of the solar system to the heating system
- Intellicon HMV+ smart burn control to optimize oil boiler firing cycles
- Adding thermostat, pump, and zone control for split-zone heat distribution (baseboards at high temp, and solar-fed radiant floor at low temp)

### Incentives

This system is eligible for a 30% federal tax credit. This credit (not deduction) is subtracted directly from an existing tax liability. Please consult with your accountant or tax professional to ensure that you will be eligible for the tax credit. The system also qualifies for a \$1,000 rebate from Efficiency Maine. ReVision Energy will assist with the required rebate application.

### Payment Terms

1/3 due upon agreement of contract  
1/3 due upon installation of the tank  
1/3 due upon completed installation

Upon customer agreement to the terms of this proposal, ReVision Energy will send an installation agreement and invoice for the first payment.

Note: Estimates of equipment or system efficiency, performance or expected energy savings are for informational purposes only. Due to the large number of variables affecting efficiency and performance that are beyond ReVision Energy's control, ReVision Energy makes no warranty or guaranty that the equipment or system installed in accordance with this proposal shall perform in accordance with such estimates.

Note: This quote is based on the estimator's determination of the best tubing layout, with minimum building disturbance. It is possible that once onsite we will determine that, for any number of reasons not apparent to the estimator, any given tubing run may prove infeasible. In such cases, our project manager will have a conversation with you to determine a better piping run, and will discuss any additional cost to you.

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