

solar hot tub - installed summer 2006

300 btu incoming solar radiation per sf here in portland
 X 32sf for the solar collector (4 x 8)
 Totals 9600 btus/hr x .85 efficiency = 8160 incoming btus per hour for the solar collector

8160 btus
 1929.47 lbs = (241 gal x 8lbs/gal)

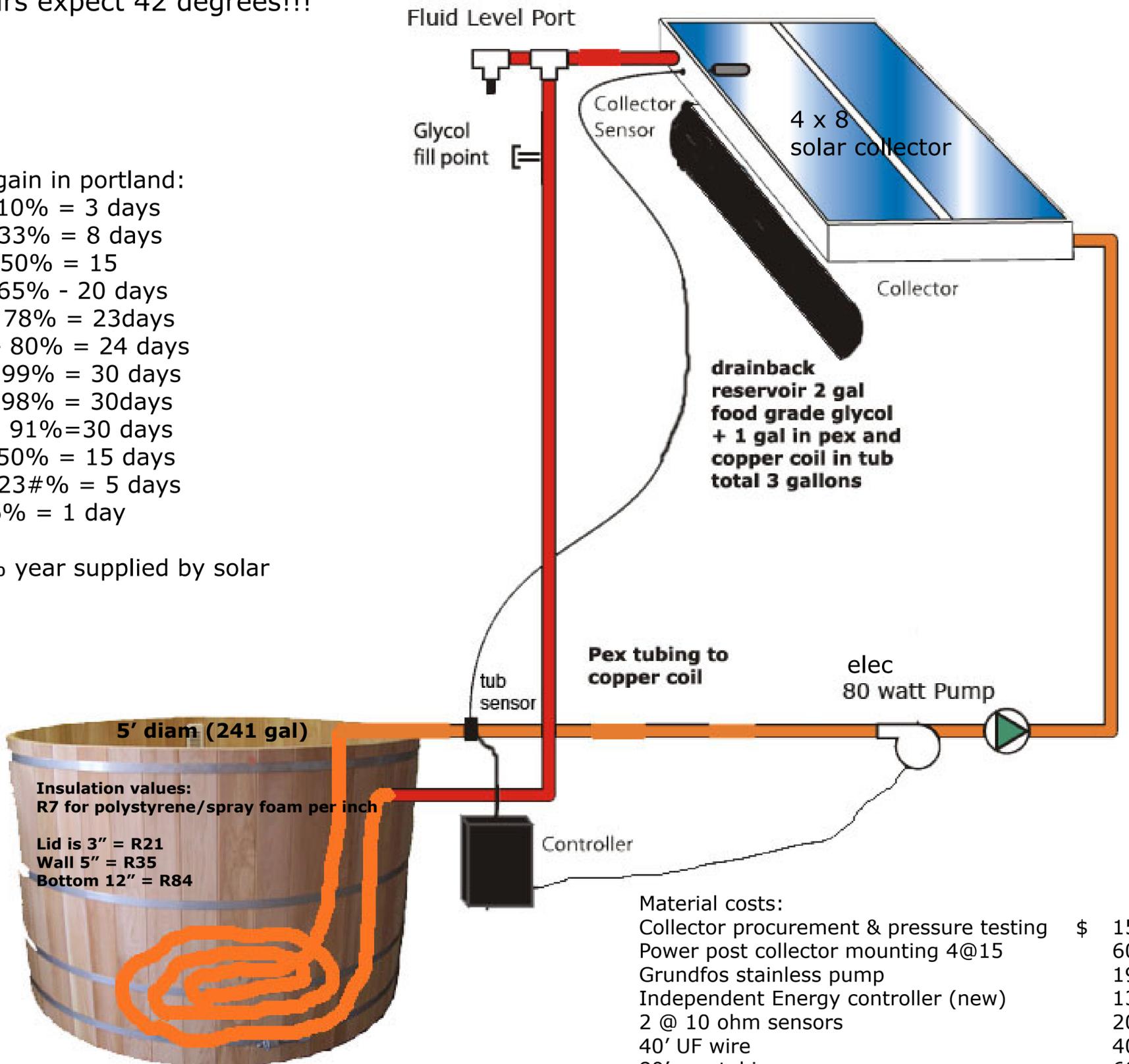
8160/1929.47 = 4.2 degree/hr

In 10 hours expect 42 degrees!!!

Solar gain in portland:

Jan - 10% = 3 days
 Feb - 33% = 8 days
 Mar - 50% = 15
 Apr - 65% = 20 days
 May - 78% = 23days
 June - 80% = 24 days
 July - 99% = 30 days
 Aug - 98% = 30days
 Sept - 91% = 30 days
 Oct - 50% = 15 days
 Nov - 23#% = 5 days
 Dec- 6% = 1 day

= 55% year supplied by solar



copper coils

Solar

Elec cost:
 80 watt pump x 6hours day= 480watt/hours day = 1/2 kwh day
 1/2 kwh = 0.04 cents per day x 204 days per year = \$8.16 year

Backup heat source

Elec hot tub pump:
 Ohms law says volts x amps = watts
 110v x 20 amp = 2200 watts
 2200 watts x 6 hours = 13,200 watts or 13.2 kwh x 0.08 = \$1.056 per day
 X 160 days without sun = \$168

Material costs:	
Collector procurement & pressure testing	\$ 150
Power post collector mounting 4@15	60
Grundfos stainless pump	199
Independent Energy controller (new)	135
2 @ 10 ohm sensors	20
40' UF wire	40
80' pex tubing	60
pex connectors	8
copper heat exchanger coil	90
drain back reservoir	150
pipe insulation	140
12" Nema 3R box	29
misc connectors, fittings, line chord	15
glycol 2 gallons @ \$19 each	38
Total	\$ 1149