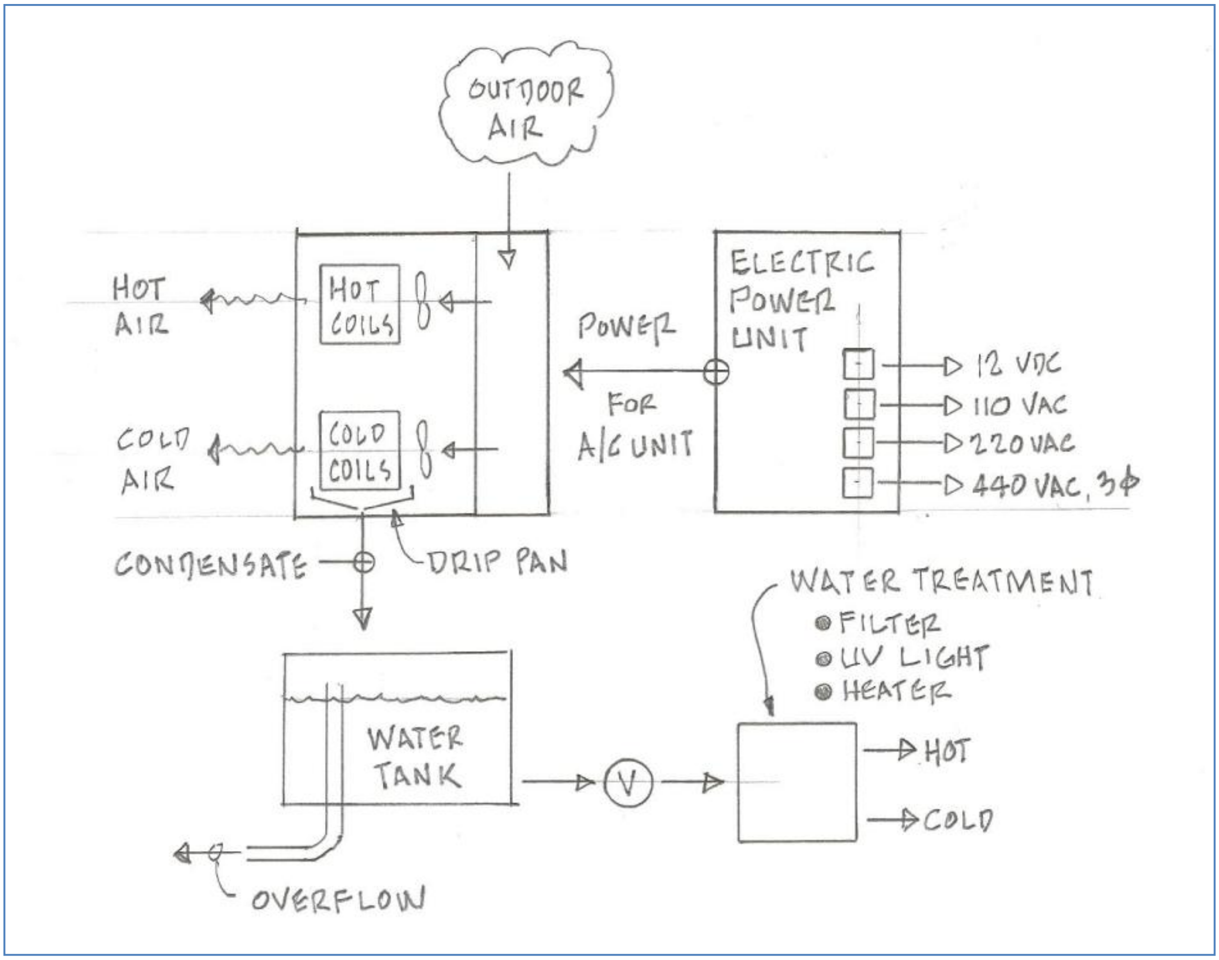
OASIS MACHINE

The following 1st concept sketch was produced as a means of defining this device as we prepare for funding applications. Also to communicate with our several development teams relative to their supplying the Electric PowerUnit:

- GEMs
- David Yurth of Nova Inst. Of Technology
- Bo Tomlyn

All other components for this OASIS machine are easily available open market, EXCEPT FOR THE POWER SUPPLY.



COMPONENTS

ELECTRIC POWER UNIT

- New technology, over unity device, requires no external power or fuel.
- Power output from 25 to 50 KW, voltages as noted.
- Internally powers pumps, fans, UV unit, refrigeration unit, lights.

ATMOSPHERIC WATER GENERATION (AWG) UNIT

- Atmospheric water is condensed out of the air by a cold surface that is colder than the dew point temperature. Any commercially available refrigeration or air conditioning unit could work in this application.
- Filters, fans, cold coils, and condensate collection pan.

WATER PROCESSING UNIT

- Agricultural water does not require processing. It flows directly from the condensate collection pan into ponds and reservoirs.
- Potable water is filtered and treated with UV light.
- Hot and cold water is produced for cooking, drinking, washing, etc.

REFRIGERATION UNIT

- The refrigeration cycle produces both hot and cold air.
- Cooling coils are used for condensing water from the atmosphere.
- Heating coils are used for heating homes, greenhouses, barns, etc.

BASIS FOR DESIGN

This unit is intended to open up for farming vast tracts of arid land that is now not being used due to lack of water. This unit runs continuously, for months and years without mechanical malfunction, and with minimum or no maintenance. Excess water will flow into ponds and reservoirs where fish and other native life forms will be nourished by this water.

The refrigeration unit would be like the old Servel Gas Flame unit, except that an electric heating element would be used to replace the gas flame. Bo Tomlyn's refrigeration unit would be used if it meets or exceeds this objective.

Bearings will be magnetic, and be designed for a minimum life of 25 years. All other components in this unit must be designed for maximum life.

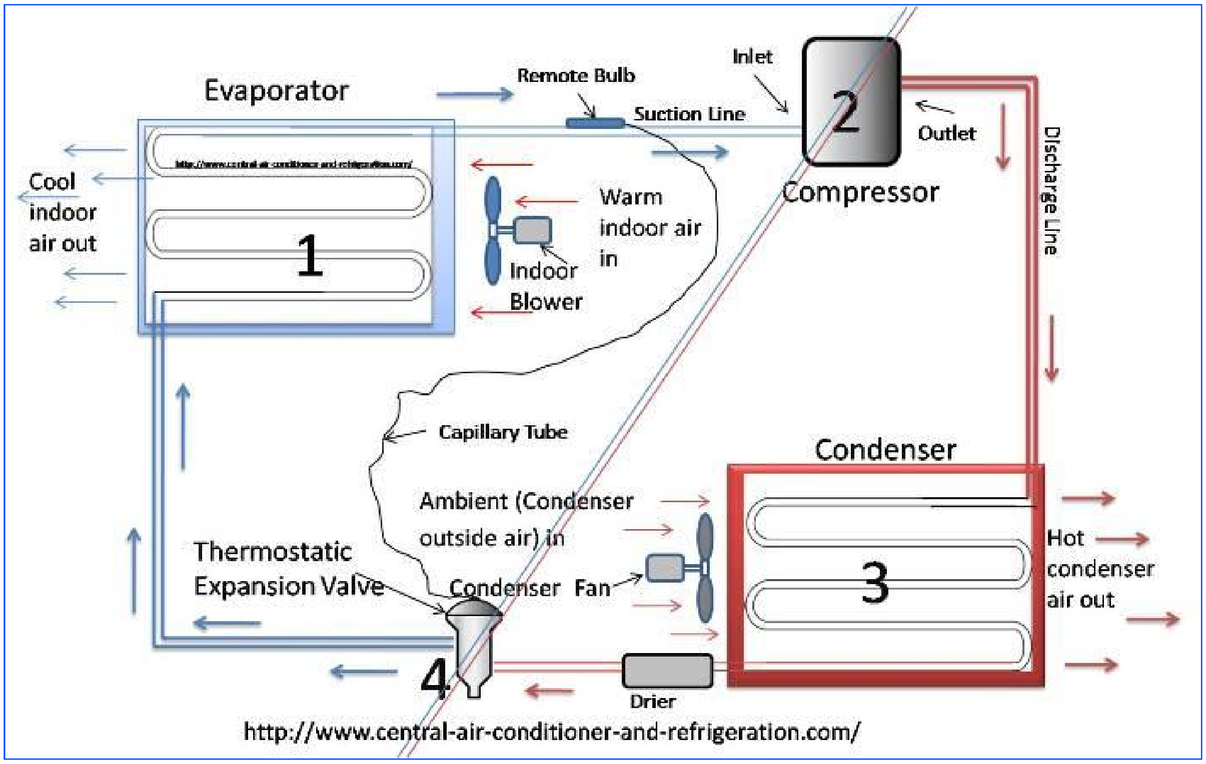
This unit would be designed to create a farming operation that could be as small as one or two families, or as large as a small community. The objective is to create a continuous supply of fresh water free of contaminants found in ground water, at no cost to the consumers.

The economic validation for this system is that it permits the creation of a strong food production base and the small farm concept that has been proven historically as a firm foundation for community building. It is the best way to provide freedom and independence for those to whom it is made available. It would be community owned and operated, and paid for by a consumption tax as the community matures and gains in economic strength.

The wealth of the community would be based on the industry of the members of that community growing enough food for their own needs, and enough beyond that for export and sale to others.

Initial target markets are those areas of Earth where they cannot afford energy or fuel, and are living with inadequate supplies of food and water. This unit is the best way to regenerate healthy living as God intended it to be.

WATER PRODUCTION FROM THE ATMOSPHERE can be produced by flowing air over a surface that has a temperature below the dew point temperature of the air. By this method, an inexhaustible supply of water can be produced by an airship in flight, or by an OASIS unit operating in any arid region on Earth. The cooling coils on a A/C system provide this water.



SOURCE: http://en.wikipedia.org/wiki/Heat_pump_and_refrigeration_cycle

Heat pump and refrigeration cycle

From Wikipedia, the free encyclopediaThermodynamic heat pump cycles or refrigeration cycles are the conceptual and mathematical models for heat pumps and refrigerators. A heat pump is a machine or device that moves heat from one location (the 'source') at a lower temperature to another location (the 'sink' or 'heat sink') at a higher temperature using mechanical work or a high-temperature heat source.[1] Thus a heat pump may be thought of a "heater" if the objective is to warm the heat sink (as when warming the inside of a home on a cold day), or a "refrigerator" if the objective is to cool the heat source (as in the normal operation of a freezer). In either case, the operating principles are identical.[2] Heat is moved from a cold place to a warm place.

Thermodynamic cycles

According to the second law of thermodynamics heat cannot spontaneously flow from a colder location to a hotter area; work is required to achieve this.[3] An air conditioner requires work to cool a living space, moving heat from the cooler interior (the heat source) to the warmer outdoors (the heat sink). Similarly, a refrigerator moves heat from inside the cold icebox (the heat source) to the warmer room-temperature air of the kitchen (the heat sink). The operating principle of the refrigeration cycle was described mathematically by Sadi Carnot in 1824 as a heat engine. A heat pump can be thought of as heat engine which is operating in reverse.

Heat pump and refrigeration cycles can be classified as *vapor compression*, *vapor absorption*, *gas cycle*, or *Stirling cycle* types.

Vapor-compression cycle

The vapor-compression cycle is used in most household refrigerators as well as in many large commercial and industrial refrigeration systems. Figure 1 provides a schematic diagram of the components of a typical vapour-compression refrigeration system.

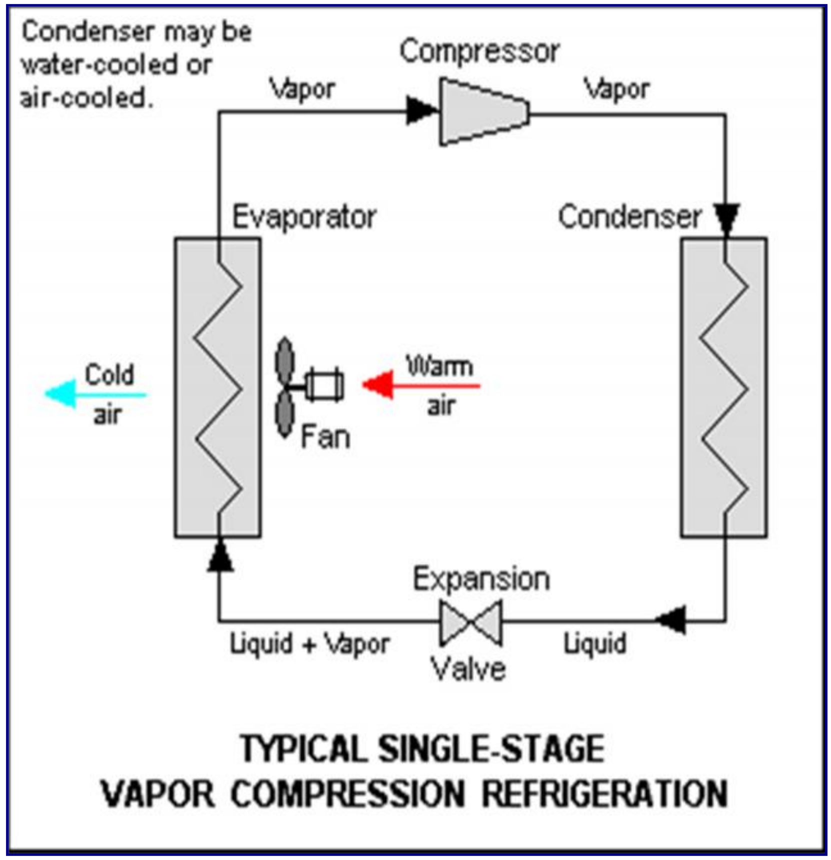
Gas cycle

When the working fluid is a gas that is compressed and expanded but does not change phase, the refrigeration cycle is called a *gas cycle*. Air is most often this working fluid. As there is no condensation and evaporation intended in a gas cycle, components corresponding to the condenser and evaporator in a vapor compression cycle are the hot and cold gas-to-gas heat exchangers in gas cycles.

The gas cycle is less efficient than the vapor compression cycle because the gas cycle works on the reverse Brayton cycle instead of the reverse Rankine cycle. As such the working fluid does not receive and reject heat at constant temperature. In the gas cycle, the refrigeration effect is equal to the product of the specific heat of the gas and the rise in temperature of the gas in the low temperature side. Therefore, for the same cooling load, a gas refrigeration cycle will require a large mass flow rate and would be bulky.

Because of their lower efficiency and larger bulk, *air cycle* coolers are not often applied in terrestrial refrigeration. The air cycle machine is very common, however, on gas turbine-powered jet airliners since compressed air is readily available from the engines' compressor sections. These jet aircraft's cooling and ventilation units also serve the purpose of pressurizing the aircraft cabin.

Figure 1: Vapor compression refrigeration



The thermodynamics of the cycle can be analyzed on a diagram as shown in Figure 2. In this cycle, a circulating refrigerant such as Freon enters the compressor as a vapor. The vapor is compressed at constant entropy and exits the compressor superheated. The superheated vapor travels through the condenser which first cools and removes the superheat and then condenses the vapor into a liquid by removing additional heat at constant pressure and temperature. The liquid refrigerant goes through the expansion valve (also called a throttle valve) where its pressure abruptly decreases, causing flash evaporation and auto-refrigeration of, typically, less than half of the liquid.

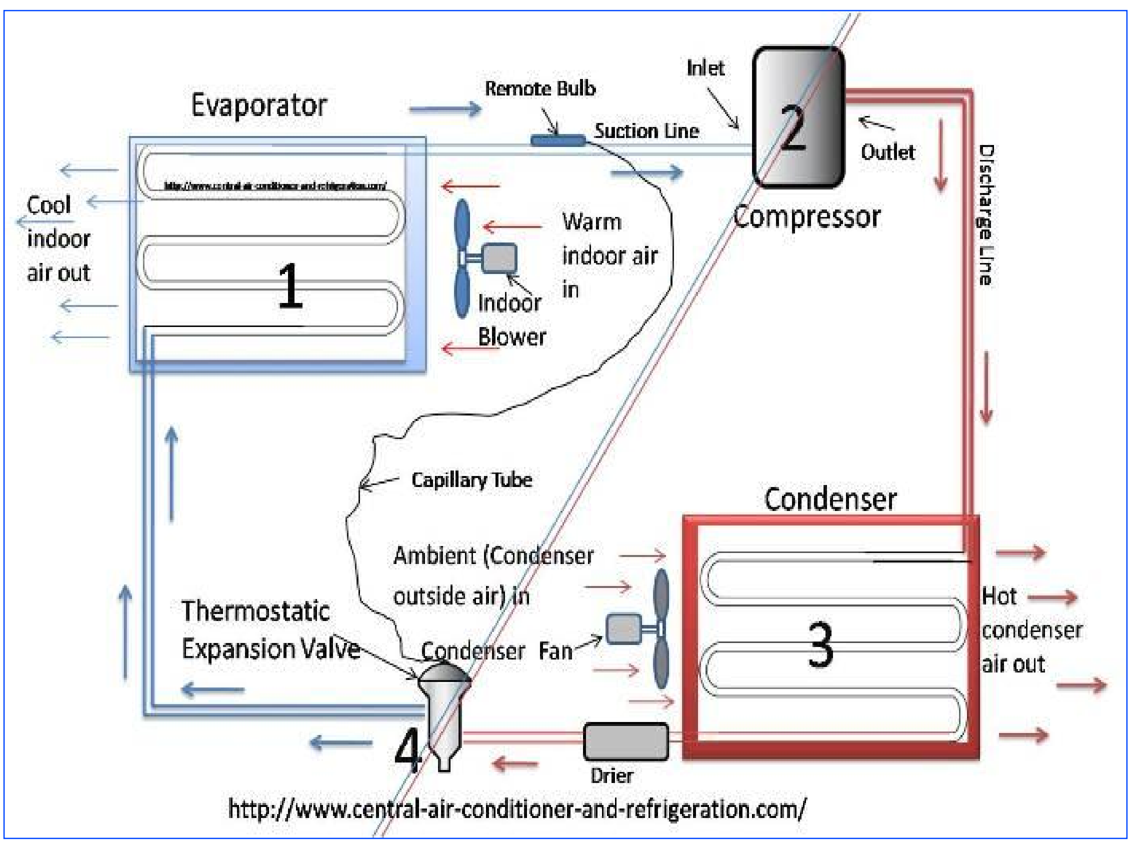
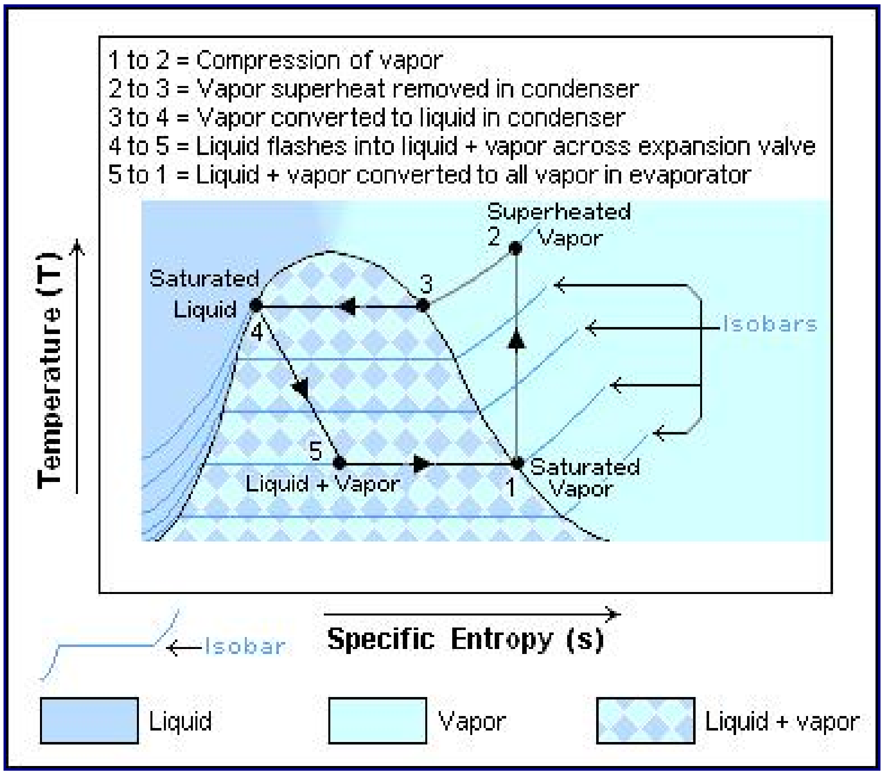


Figure 2:Temperature–Entropy diagram

That results in a mixture of liquid and vapor at a lower temperature and pressure. The cold liquid-vapor mixture then travels through the evaporator coil or tubes and is completely vaporized by cooling the warm air (from the space being refrigerated) being blown by a fan across the evaporator coil or tubes. The resulting refrigerant vapor returns to the compressor inlet to complete the thermodynamic cycle.

The above discussion is based on the ideal vapor-compression refrigeration cycle, and does not take into account real-world effects like frictional pressure drop in the system, slight thermodynamic irreversibility during the compression of the refrigerant vapor, or non-ideal gas behavior (if any).

More information about the design and performance of vapor-compression refrigeration systems is available in the classic "Perry's Chemical Engineers' Handbook".



Vapor absorption cycle

Main article: Absorption refrigerator

In the early years of the twentieth century, the vapor absorption cycle using water-ammonia systems was popular and widely used but, after the development of the vapor compression cycle, it lost much of its importance because of its low coefficient of performance (about one fifth of that of the vapor compression cycle). Nowadays, the vapor absorption cycle is used only where waste heat is available or where heat is derived from solar collectors.

The absorption cycle is similar to the compression cycle, except for the method of raising the pressure of the refrigerant vapor. In the absorption system, the compressor is replaced by an absorber which dissolves the refrigerant in a suitable liquid, a liquid pump which raises the pressure and a generator which, on heat addition, drives off the refrigerant vapor from the high-pressure liquid. Some work is required by the liquid pump but, for a given quantity of refrigerant, it is much smaller than needed by the compressor in the vapor compression cycle. In an absorption refrigerator, a suitable combination of refrigerant and absorbent is used. The most common combinations are ammonia (refrigerant) and water (absorbent), and water (refrigerant) and lithium bromide (absorbent).

Stirling cycle

Main article: Stirling cycle

The Stirling cycle heat engine can be driven in reverse, using a mechanical energy input to drive heat transfer in a reversed direction (i.e. a heat pump, or refrigerator). There are several design configurations for such devices that can be built. Several such setups require rotary or sliding seals, which can introduce difficult tradeoffs between frictional losses and refrigerant leakage.

The Free Piston Stirling Cooler (FPSC) is an elegant, completely sealed heat transfer system that has only two moving parts (a piston and a displacer), and uses helium as the working fluid. The piston is typically driven by an oscillating magnetic field that is the source of the power needed to drive the refrigeration cycle. The magnetic drive allows the piston to be driven without requiring any seals, gaskets, O-rings, or other compromises to the hermetically sealed system. Claimed advantages for the system include environmental friendliness, cooling capacity, light weight, compact size, precise controllability, and high efficiency.

The FPSC was invented in 1964 by William Beale, a professor of Mechanical Engineering at Ohio University in Athens, Ohio. He founded and continues to be associated with Sunpower Inc., which specializes primarily in researching and developing FPSC systems for a wide variety of military, aerospace, industrial, and commercial applications. Sunpower also makes cryocoolers and special pulse tube coolers capable of reaching below 40°K (around –390°F, or –230°C). A FPSC cooler made by Sunpower was used by NASA to cool instrumentation in satellites.

Since 2002. another leading supplier of FPSC technology has been the Twinbird Company in Japan, which also markets a broad line of household appliances. Both Sunpower and Twinbird appear to work in collaboration with Global Cooling NV, which is located in the Netherlands, but has a research center in Athens, Ohio.

For several years starting around 2004, the Coleman Company sold a version of the Twinbird "SC-C925 Portable Freezer Cooler 25L" under its own brand name, but it has since discontinued offering the product, in spite of favorable customer reviews on Amazon. The portable cooler can be operated more than a day, maintaining sub-freezing temperatures while powered only by an automotive battery. This cooler is still being manufactured and distributed worldwide, with Global Cooling now coordinating distribution to North America and Europe. Other variants offered by Twinbird include a portable deep freezer (to –80°C), collapsible coolers, and a special model for transporting blood and vaccine.

In addition to the technical information available on the websites referenced above, a step-by-step photographic teardown of the Coleman (Twinbird) FPSC cooler is viewable online.