Q: How can adding heat to the system be a benefit?

A. In reality, there is no additional heat being added to the system. The variable speed or modulating systems along with their logic controls, ensure this is not the case on today's modern HVAC systems. We are only replacing an element of thermal energy that would normally be generated by the compressors.

Q: How does the condenser cope with the additional heat?

A. There is no heat added above the standard design points of the condenser. The thermal energy produced by solar thermal collectors will always be offset by the reduction in the thermal energy produced by the compressors.

Q: Does this technology work on a single fixed-speed compressor?

A. No. ThermX is not designed to operate with single fixed speed compressors, simply because the compressor has no ability to unload. On a variable load system, (having the ability to unload or stage down), the system will slow down or drop stages as the logic controls recognise the combined thermal energy from the compressor and the solar. As the solar is now replacing an element of the thermal energy the compressor would normally output at a higher load draw, this provides the energy consumption savings at the compressor.

Q: Does the technology work with multiple, fixed speed compressors?

A. Yes. ThermX will work with most modulating systems. Examples of this may include Mini/Multi splits, multi-stage packaged units, rack refrigeration, screw-type chillers, multi-stage air-cooled chillers.

Q: By raising temperature, are you not also raising pressure?

A. On a fixed speed system, whereby the compressor does not have the ability to modulate or stage down, when adding additional heat to the system you would expect to see an increase in pressure, simply because the compressor does not have any way to modulate its load, as importantly the condenser is designed to manage the compressor running at all operational times in full capacity. See question 3. Some consider the heat to be only a by-product of the pressurisation process, this is factually incorrect. Without it, the cooling effect could not, nor cannot be achieved. Pressure and thermal energy are collectively vital sources in the refrigerant process. Though, it is also important to appreciate that in the modern-day modulating system, the thermodynamic method is vital for efficiency improvement. A rise in thermal energy does not always result in a rise in pressure. To further emphasise this point, and as an example, all today's VRF/VRV/MDV systems are manufactured with not a single pressure transducer linked to the operational logic controls. They are all thermal transducers.

Q: On what type of systems does this technology work best?

A. Solar Thermal cooling achieves the most attractive results on all types of air-cooled Variable Refrigerant Flow Systems. VRF for example, has the ability to stage down to 30% or less of its total capacity. VRF systems are designed to rapidly respond and modulate accordingly. Staged systems also work well, but generally react a little slower to the solar addition as they are restricted to their capacitive tiers.

Q: Can this technology cause system oil degradation?

A. No. Even when the system has sat dormant in the sun for long periods of time, the heat exchange generated never reaches the temperatures required to influence the oil degradation point.

Q: Does this technology work with heat pumps?

A. Absolutely. In fact, if the system is solely used for heating, then the technology can in this case be installed on a single fixed speed system.

Q: What additional electronics/controls do you add to the system?

A. There is nothing added on a cooling-only system (i.e. refrigeration). The installation mostly consists of additional pipework and relies on the system manufacturer's existing control logic to recognise the solar thermal energy. On systems that can benefit from heat pump, a solar diverter control (SDV) is added to the system. This unit is completely remote with zero interaction with the system's own logic controls. In cool mode, the SDV remains open to the solar, in heat mode it remains closed until its senses additional thermal energy is available in the solar array, at this stage it will open to allow flow of refrigerant through.

Q: Is there a refrigerant change required when installing ThermX?

A. No.

Q: Are there any refrigerants that don't work with this technology?

A. The technology works with most common types of modern refrigerant other than CO2. We are also in R&D phase with Ammonia.

Q: Is there a requirement to resize or replace any of the existing components on the system?

A. No. There are no alterations, nor additional equipment required other than the collectors, pipework and SDV (for heat pump systems) on retrofit installations.

Q: Can this system be installed on chillers, i.e. Glycol?

A. Yes. As long as they are air-cooled and cooling a transfer fluid.

Q: Can this system be installed on Water-Cooled Systems?

A. In theory, yes, however, it is not considered commercially viable in most cases. Water-cooled condensers are effectively accomplishing some of the benefits that ThermX would provide, but on the opposite spectrum of the Delta T. The limited benefit that can be achieved is counterweighted by the investment cost.

Q: Can the solar thermal heat the refrigerant too far?

A. No. As the thermal panel continues to provide thermal energy, the compressor slows or stages down accordingly, thus allowing the panel to replace the thermal energy the compressor would normally produce. The collective system therefore still provides the same or increased capacity, while running at much lower speeds. When the compressor is running at full capacity, the uplift in temperature is minimal.

Q: Can the system be partnered with geothermal?

A. If the geothermal loop is used for the purposes of heating, then yes. If the cooling process is accomplished via a variable speed system with refrigerant, then yes. If the cooling is being accomplished via geo-source, into a hydronic coil, then no.

Q: Are there any other heat sources that can be used to produce this process?

A. Our patented technology covers any third-party heat source situated between the compressor and the condenser. These heat sources could include, but are not limited to: waste heat recovery, geo-thermal, directly applied heat exchange, solar thermal transfer.

Q: Are there any size restrictions for installing this technology?

A. No.

Q: Is additional refrigerant required for the installation?

A. Yes. A varying amount of additional refrigerant is required, based on the number of panels and additional pipework required for the install. In comparison to the level of refrigerant already in the system, the additional amount required is minimal in context.

Q: Is there refrigerant or any other liquid-based product in the solar thermal tubing of the panel? If so, what happens if the glass breaks?

A. The refrigerant is always contained within the copper pipe work of the system, either passing through a heat exchanger or routed within the evacuated tube, dependent upon the system we are utilising. The refrigerant never comes into direct contact with the glass of the evacuated tube and as such, these can be changed very quickly with zero system interruption.

Q: Does ThermX work on residential A/C units?

A. Yes. In fact, SolX Energy has partnered with the world's leading manufacturer, to produce our own, Solar Thermal ready, inverter-driven systems for the residential market. They are also ready AHRI rated. Dependent on the region, upwards of 35% additional efficiency over the stated SEER rating, can be achieved.

Q: Does adding ThermX void our equipment manufacturers' warranty?

A. In some cases, yes. In most cases however (in-excess of 80%) the manufacturers' warranty has already expired. If the product is still under warranty, then it is likely that the equipment manufacturers' warranty will become void. SolX Energy can however in most cases provide a 3-party backed warranty program that maintains or extends coverage.

Q: Do you have complete A/C systems available for commercial installations?

A. Yes absolutely. SolX offers commercial systems of all types, VRF's, Air Cool Chillers, etc. They are manufactured by the largest HVAC manufacturer in the world, who also white label manufacture for the likes of Carrier, Lennox, Dunham Bush & Toshiba along with many of the other big HVAC name brands.

Q: How much downtime can be expected during commissioning?

A. This is dependent on a number of elements. The system will require the removal of refrigerant, the connection of the collectors, then a recharge of the refrigerant. Therefore, the time required for commissioning is system size dependent and could range from just an hour to the entire day.

Q: What is the maximum distance between compressor or condenser to the panel array?

A. Again, this depends on system size and type. On the smallest systems - no more than 20ft (c.6m). On larger systems, in particular VRF, this can increase to over 100ft (c.30m).

Q: How much additional heat is added from the solar collectors, and what is the minimum amount of heat required for ThermX to be effective.

A. The lower the discharge from the compressor, the more thermal energy can be added to the refrigerant. The maximum observed refrigerant temperature leaving the solar collectors is 132°C or 269°F. The required uplift temperature is dependent on the required Delta T to create state change, allowing the compressor to unload. Under normal circumstances, the efficiencies can be achieved with an uplift in temperature exceeding 15°C (26°F).

Q: Where is ThermX manufactured?

A. Currently, we supply two differently designed ThermX panels. As of now, our systems are manufactured by a major corporation in Ireland, as well as our in-house controlled manufacturing facility in Jaingsu Province, China.

Q: Will ThermX be manufactured in the US?

A. Yes. We are currently in the process of securing US manufacturing facilities.

Q: What is the pressure rating of the collectors?

A. 45bar or 650psi

Q: Will demand charges still be an issue with the SolX product, because the increased efficiency is based on an uncontrolled energy source - the sun?

A. Demand charges are applied based on the energy consumption during demand hours. ThermX is most effective during the hottest parts of the day (i.e. demand hours). Therefore, the times when the system is working most effectively is when the customer is generally charged at the highest rates. As such, demand charges can be reduced significantly.

Q: How is the system priced? What is the price per ton for commercial applications?

A. Systems are priced according to size, and installation is priced by the contractor. Typically, one solar collector is required for between 3.5 and 7 tons of cooling, depending on the discharge line size of the system. More importantly, a typical baseline ROI is almost always below 4-years, majority below 3-years and in some cases below 2-years.

Q: How is efficiency affected, based on the direction the ThermX panels are facing?

A. Certainly, if the panel isn't facing primarily toward south, or falls under a cast shadow for much of the day, the efficiency will be reduced.

Q: Do you have any studies, comparisons, or have any multi-year tests been completed on the product?

A. We have many client evaluations on our website, under the downloads section. Some of which have been installed for multiple years. We also hold multiple year data pre vs. post on some systems. No everything we have is on the website, so please ask if you require more data.

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