TWO NEW FULL ENJECTOR PLANTS

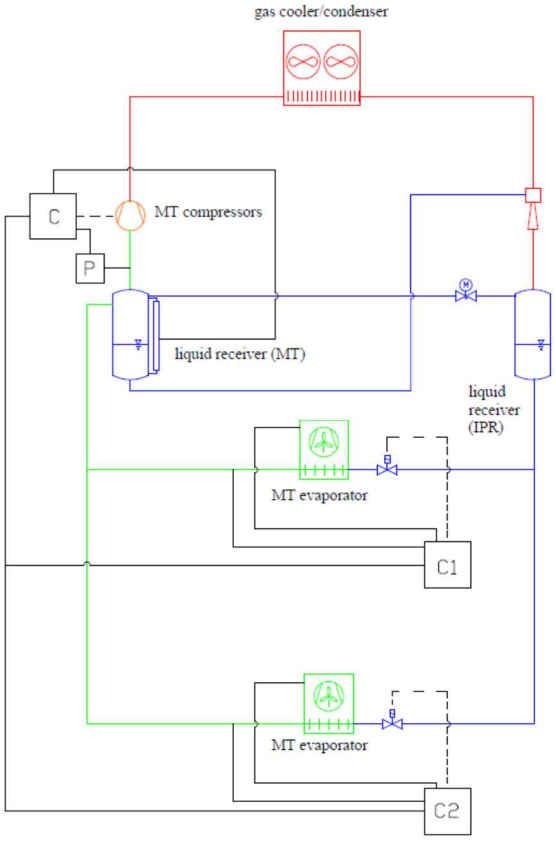
Enex has built and installed two plants with complete optimization of the operation of the evaporators in flooded mode with a new controller specifically developed. After more than 200 plants with liquid ejector produced since 2012, Enex has developed, through the collaboration with Dixell, a leading manufacturer of electronic controls, a complete and optimized regulator of the ejector system. For the first time, all the methods for optimizing the concept developed and patented by Enex have been installed (EP 2718642).

FLOODING OBTAINED WITH EJECTOR

The basic scheme is now well known: the ejector is used as a pump to recirculate the fraction of mass flow not evaporated . In this way the evaporator exchange surface is completely used and the evaporation temperature can be raised to the maximum. The same benefit could be obtained with a pump, which however would be less reliable and more expensive than an ejector.

The power required for pumping is very low, so even in winter conditions the ejector is perfectly able to pump the small amount of liquid exiting the evaporators, without the need of a pump with the associated problems (risk of cavitation, difficulty in pumping a saturated liquid, for example).

The Enex system consists of a few elements, each with a specific function.



• Suction liquid level measurement: it allows to understand if the pumping effect is sufficient and / or if the opening of the valves is excessive

• Exchange of operating data between Evaporators and Central Controller thanks to the Dixell XeCO2 monitoring system: it allows to understand if the evaporation temperature is correct for the temperature required by refrigerated counters and cold rooms

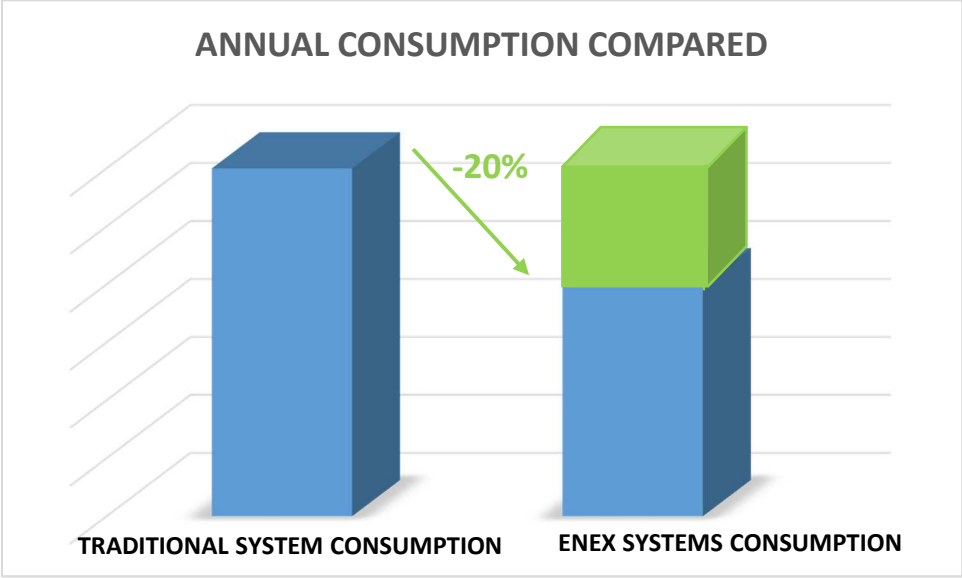
• Central control with variable pressure, so as to raise the evaporation temperature to the minimum sufficient value

• Control of the evaporators expansion valve based on air temperature and only if necessary based on superheat (variable)

The overfeeding method was also applied to the low temperature section of a booster, according to a second Enex patent.

COMPARISON BETWEEN DIFFERENT OVERFEEDING SYSTEMS

The innovation introduced by Enex from 2012 to 2014 has raised much interest and has been widely imitated, given the undeniable energy advantages (measured over 20% savings, in addition to an increase in reliability).
In the market there are alternative solutions to Enex patented product but they are obviously not equivalent in terms of efficiency. Alternative solutions have a limited potential and cannot produce the same benefits obtained through the original Enex concept.



Some of the alternative methods proposed are always based on superheating control. This does not allow a overfeeding control, because, by definition, when superheat is zero, any control on the flow rate introduced into the evaporator is lost.

The advantages of the Enex solution are:

- Low percentage of oil flowing into the evaporators;
- easy identification of any malfunction thanks to the direct control of the liquid level in the suction accumulator;
- circulation pump not necessary;
- fast reaction of the ejector and better control
- thanks to the continuous exchange of data between evaporators and central controller, the evaporation temperature can be raised to the maximum value physically possible;
- direct and active control of the liquid level makes impossible that liquid enters the compressors;
- reduced volume of suction receiver;
- The method can be used both on booster systems and only-MT systems;
- no need of expensive and complicated systems to measure vapor quality.
- simplicity and absolute reliability.

Ultimately, the Enex "liquid ejector" system is the best solution on the market today to maximize plant efficiency by flooding the evaporators.