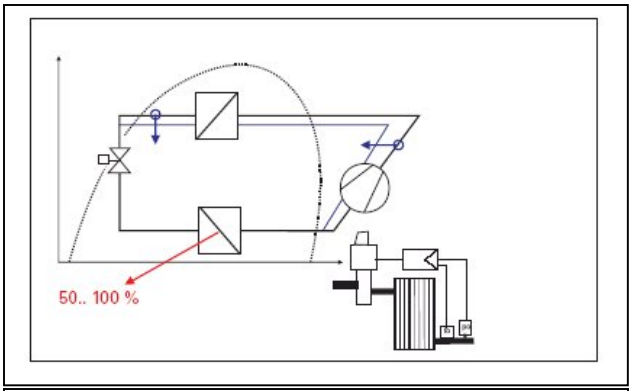
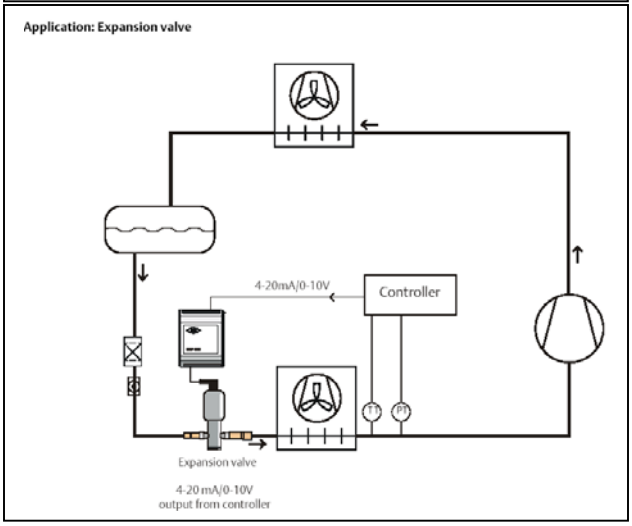
Application Example
Electronic Superheat and Capacity Control





- Save Energy
- Increase Efficiency
- Accurate Control
- Increased product quality
- Proven Performance
- Low Cost

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Background - Superheat

Evaporators require an expansion valve that *expands* the liquid Refrigerant, which is under condensation pressure, to the evaporation pressure by throttling it (lowering the pressure without changing the enthalpy content).
The expansion valve also performs the task of a controller as it delivers exactly the amount of liquid refrigerant the evaporator evaporates and the compressor sucks in. In other words, the expansion valve establishes an equilibrium in the refrigeration circuit.
The controlled variable is the superheat.

Superheat is an indication that evaporation in the evaporator is completed. Hence, superheat is the differential of saturated refrigerant temperature and actual gas temperature at the evaporator's outlet.

Capacity regulation by changing the superheat?

With mechanical thermostatic expansion valves, superheat is set to a fixed value.
If the superheat can be continually changed, it is also possible to adjust the evaporator's capacity, matching it to the demand.

Electronic Refrigeration components are capable of optimally and continually adapting the evaporator's capacity to the demand by increasing or decreasing the level of superheat.

In addition, under full load conditions, the evaporator should be filled with as much liquid refrigerant as possible, allowing the system to operate with low superheat. Higher charging levels also lead to higher evaporation temperatures and, therefore, to a better COP.

Electronic Superheat Control can save compressor energy a minimum of 5%. Superheat Control *with* Capacity control can significantly increase the saving further . Studies have shown savings greater that 15%.

Electronic TX Valve Control Advantages

- Lower Condensing and Higher suction pressures save compressor energy
- Enhanced and accurate control performance owing to PID control
- Optimum use of the evaporator and, therefore, better COPs
- Precise adaptation to the demand due to superheat adaptation
- High level of reliability
- MOP and equipment protection functions
- Rapid and accurate handling of large pressure variations resulting from varying loads