

Thermosyphon - Free Cooling

Smardt Chiller
with Thermosyphon

SMARTD

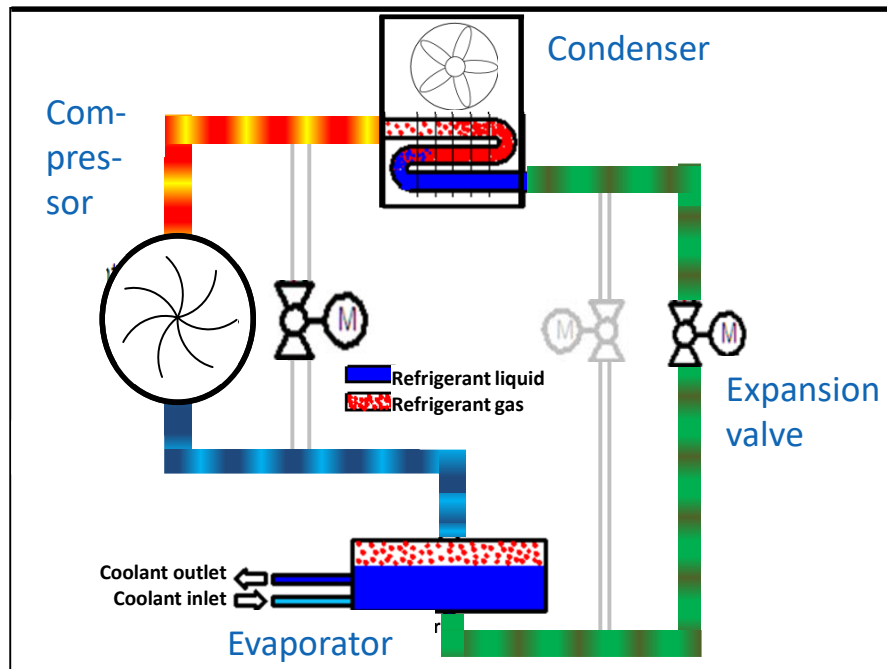
Definition

- **Free Cooling** = chilled water production without compressor by low ambient temperature

Smardt-OPK Thermosyphon free cooling

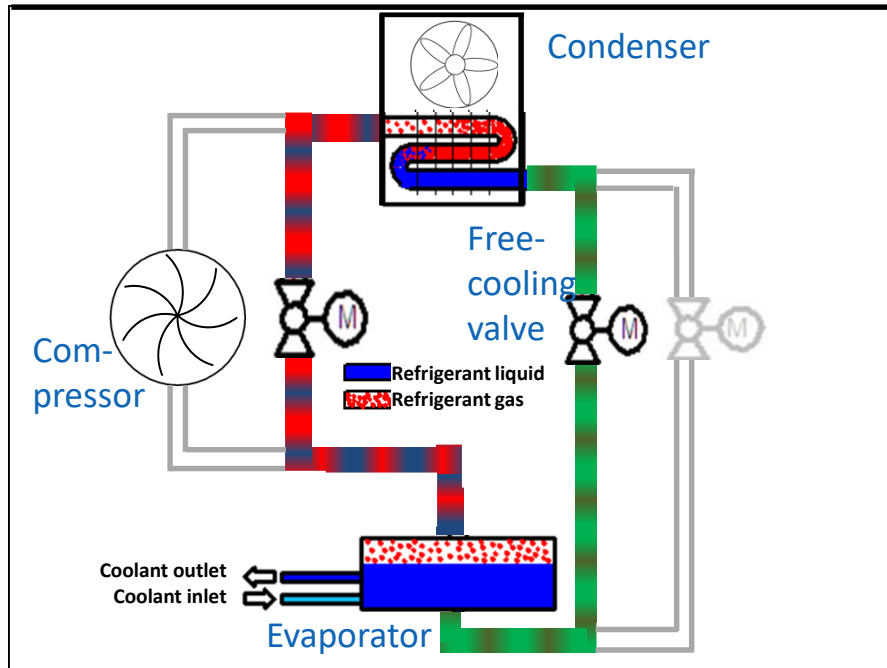
Oil free turbo compressor + flooded evaporator + air-cooled condenser + Smardt-OPK know-how

Compressor mode



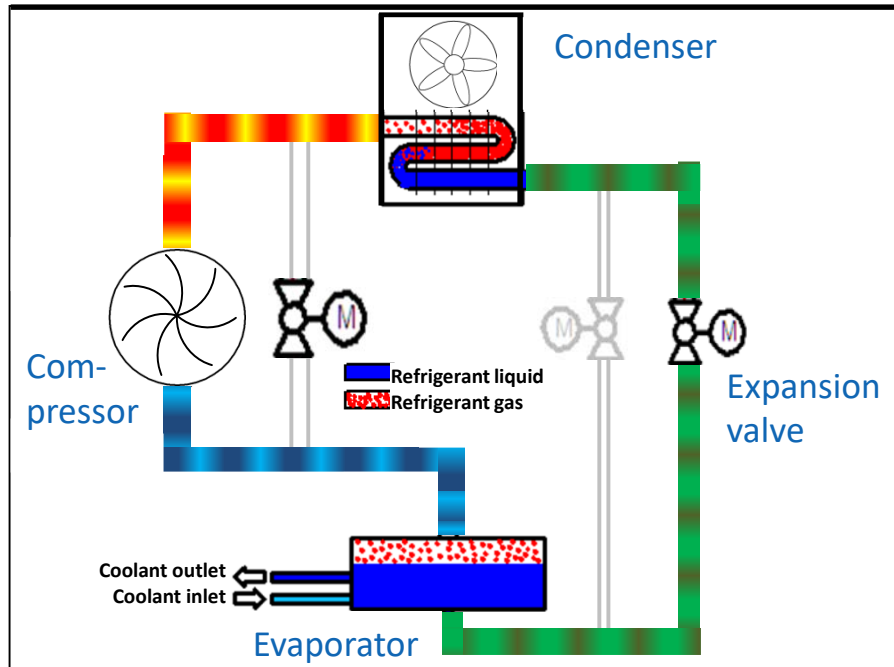
Thermosyphon - free cooling mode

Thermosyphon free cooling = chilled water without compressor - one refrigerant circuit → „either or“ function

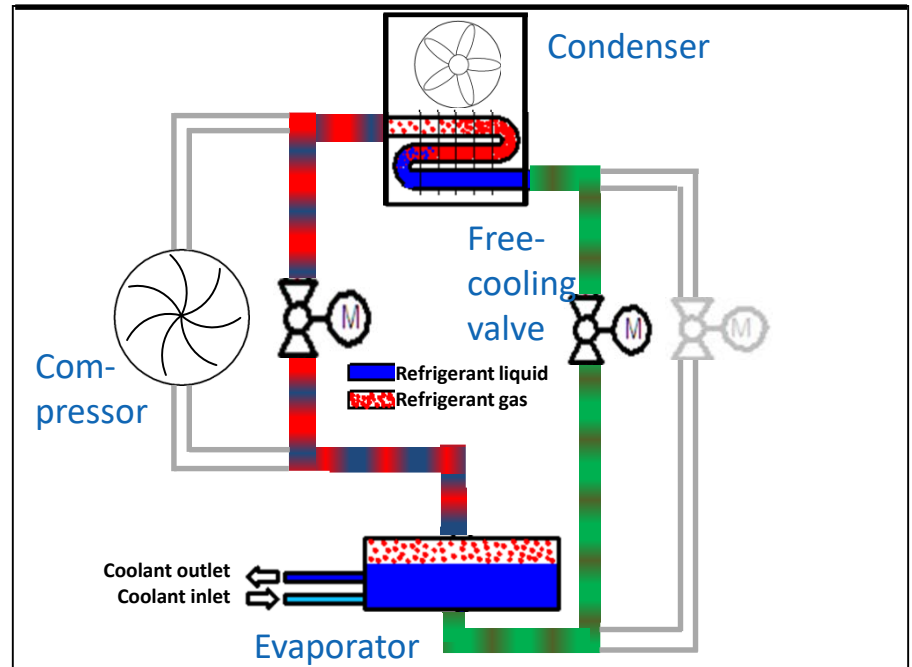


Compressor vs Thermosyphon mode

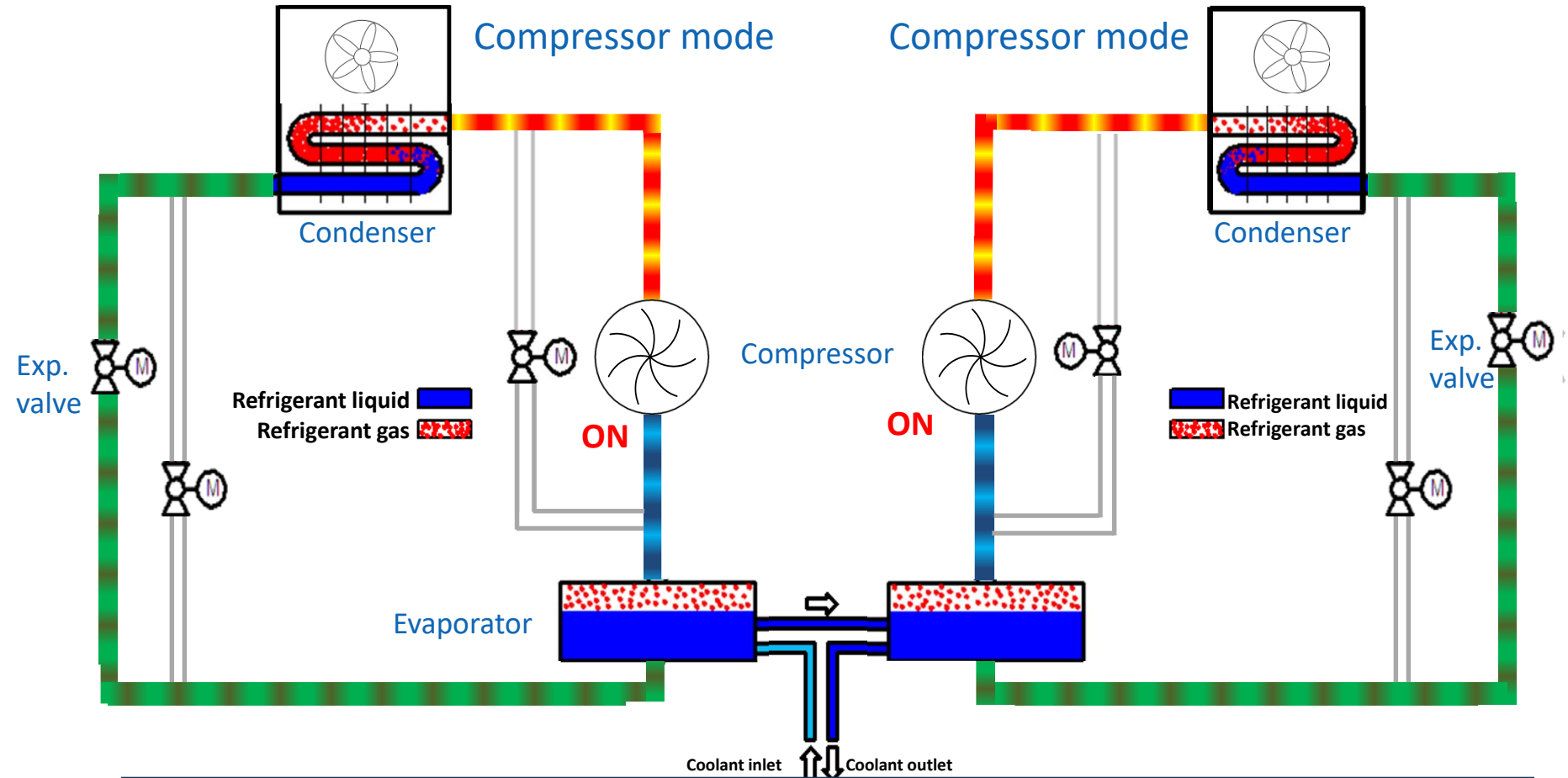
Compressor mode



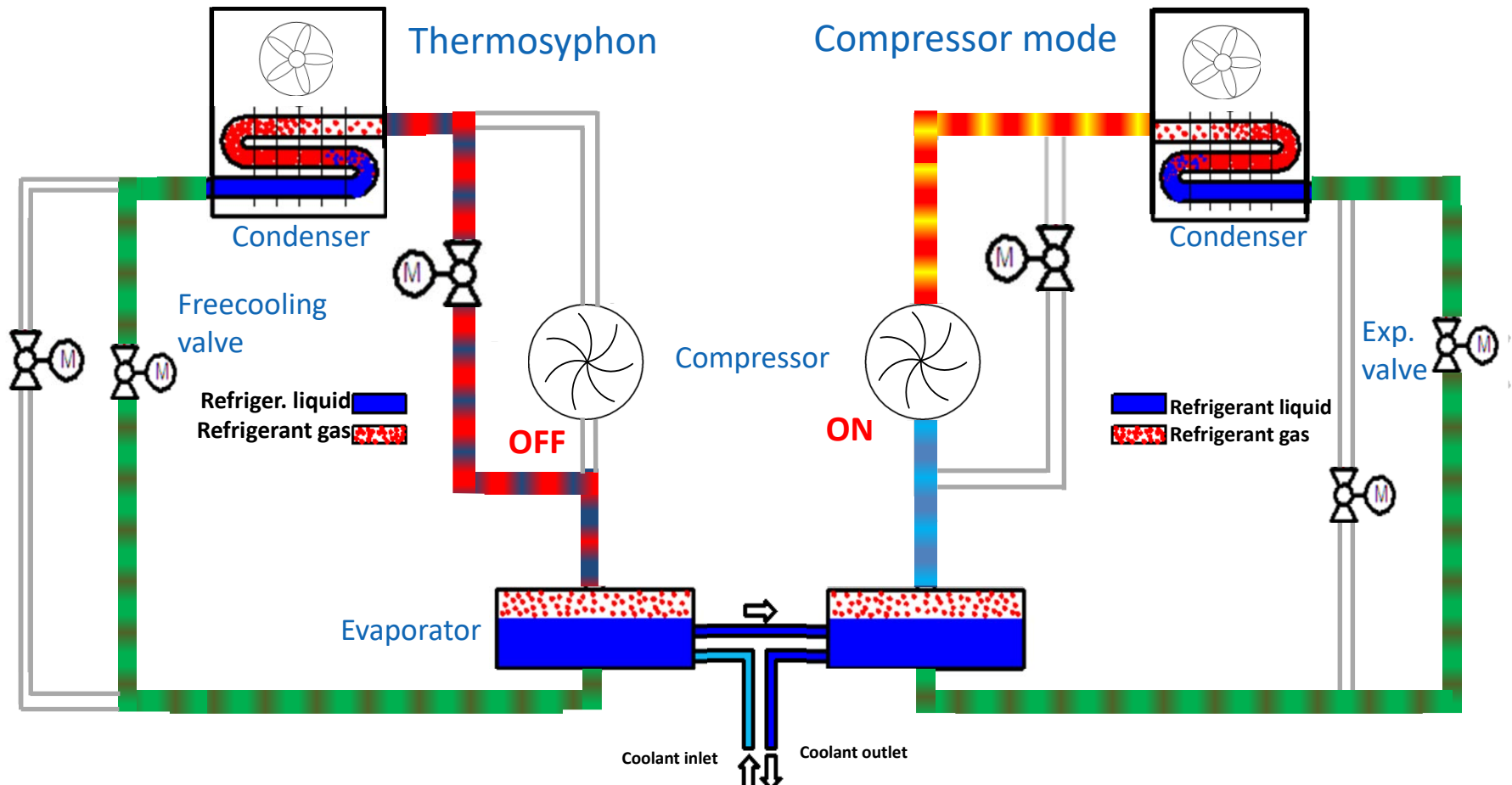
Thermosyphon free cooling mode



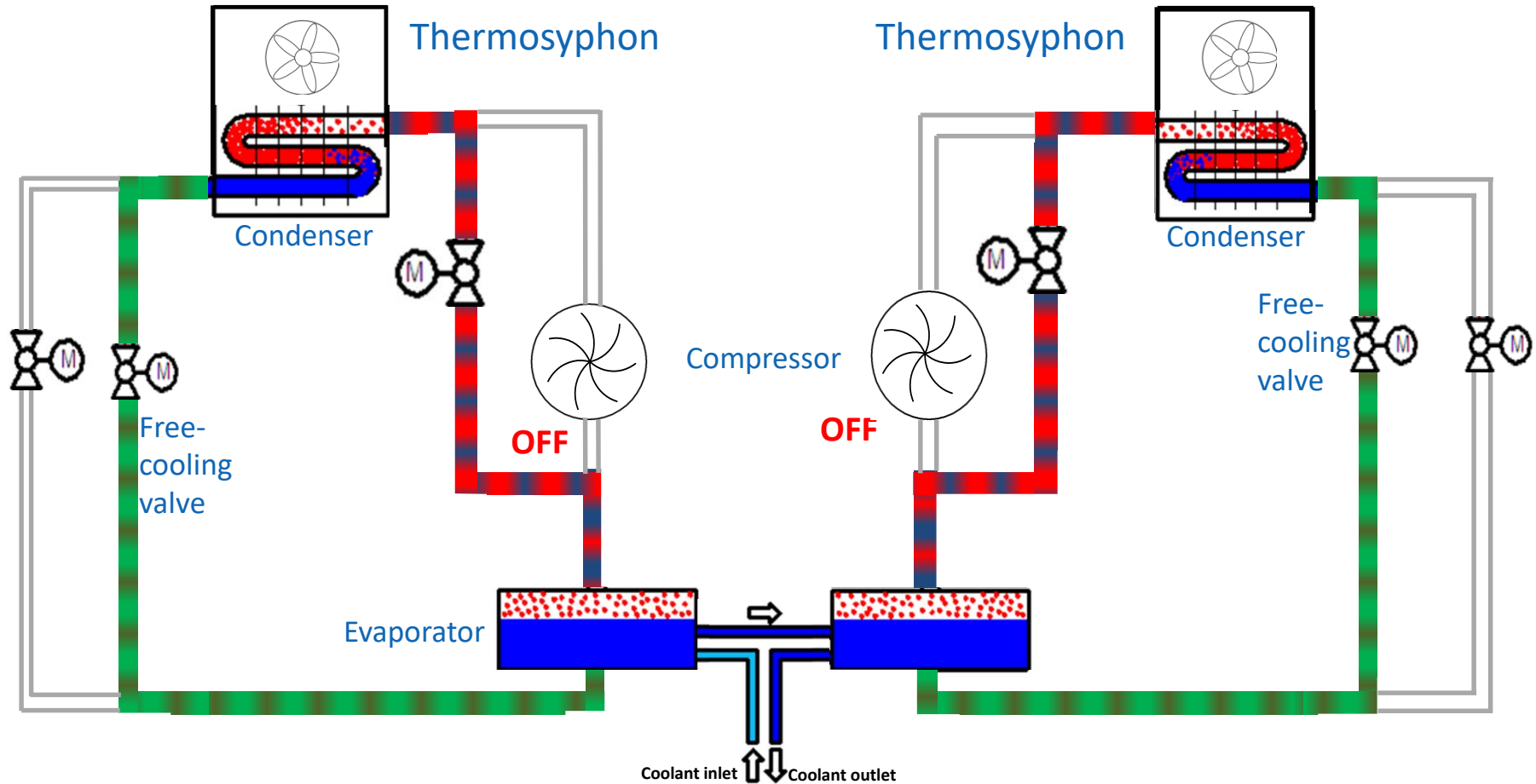
Compressor operation



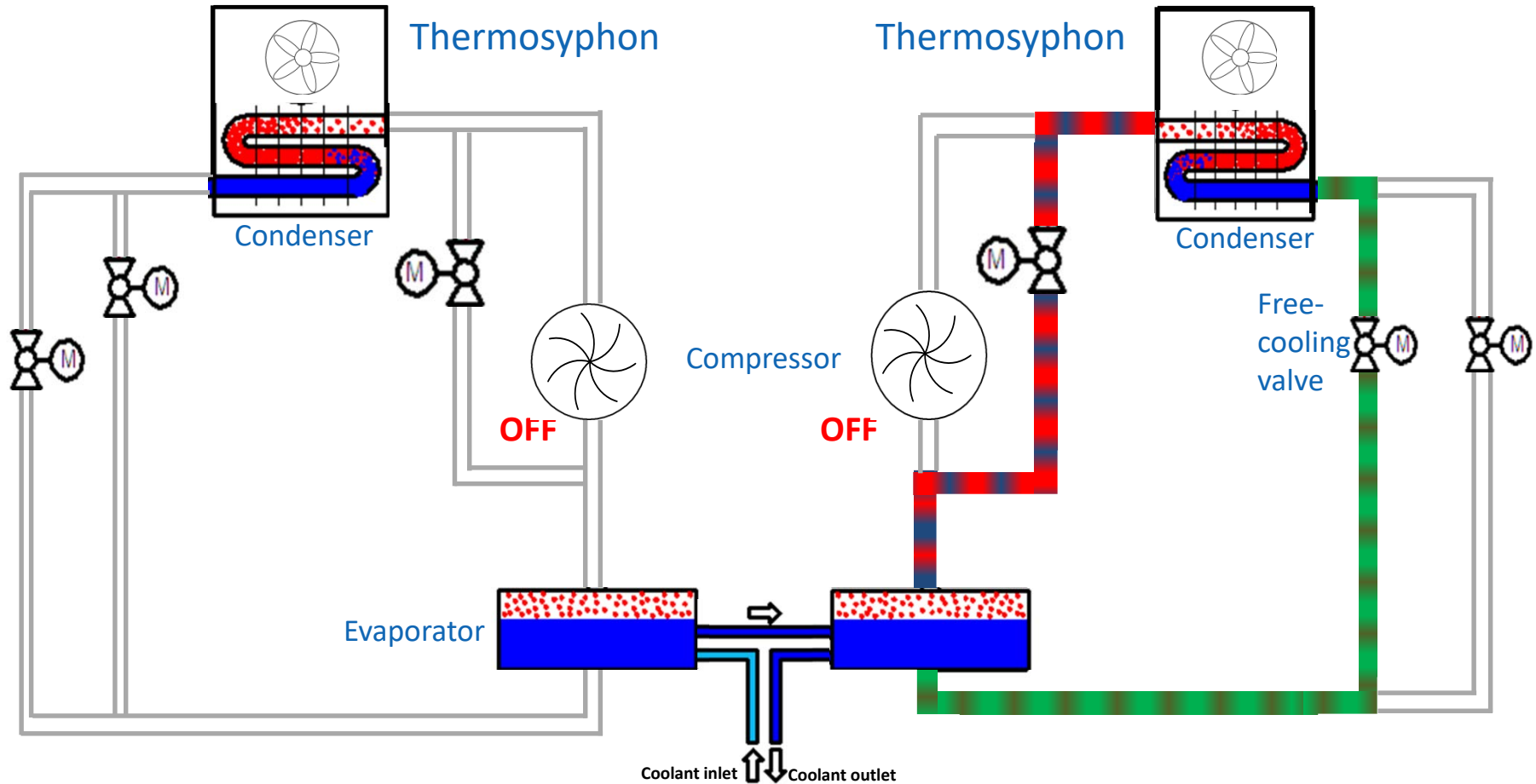
Parallel operation



Thermosyphon free cooling



Thermosyphon free cooling



Advantages of Thermosyphon

Lower investment

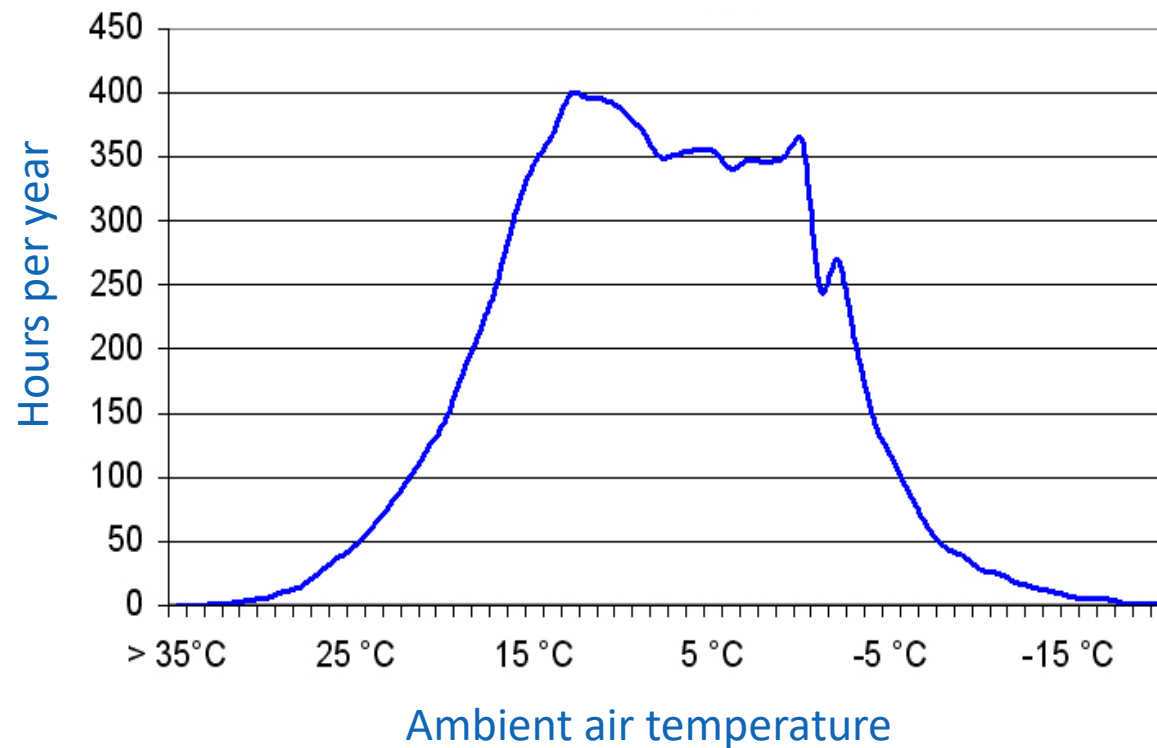
- No separate dry cooler system
- No additional water pipes and pumps needed
- Smaller footprint

Reduced power consumption/ Environment-friendly

- No loss of efficiency by heat transfer (heat exchanger glycol/water)
- No additional free cooling pumps
- Lower sound pressure

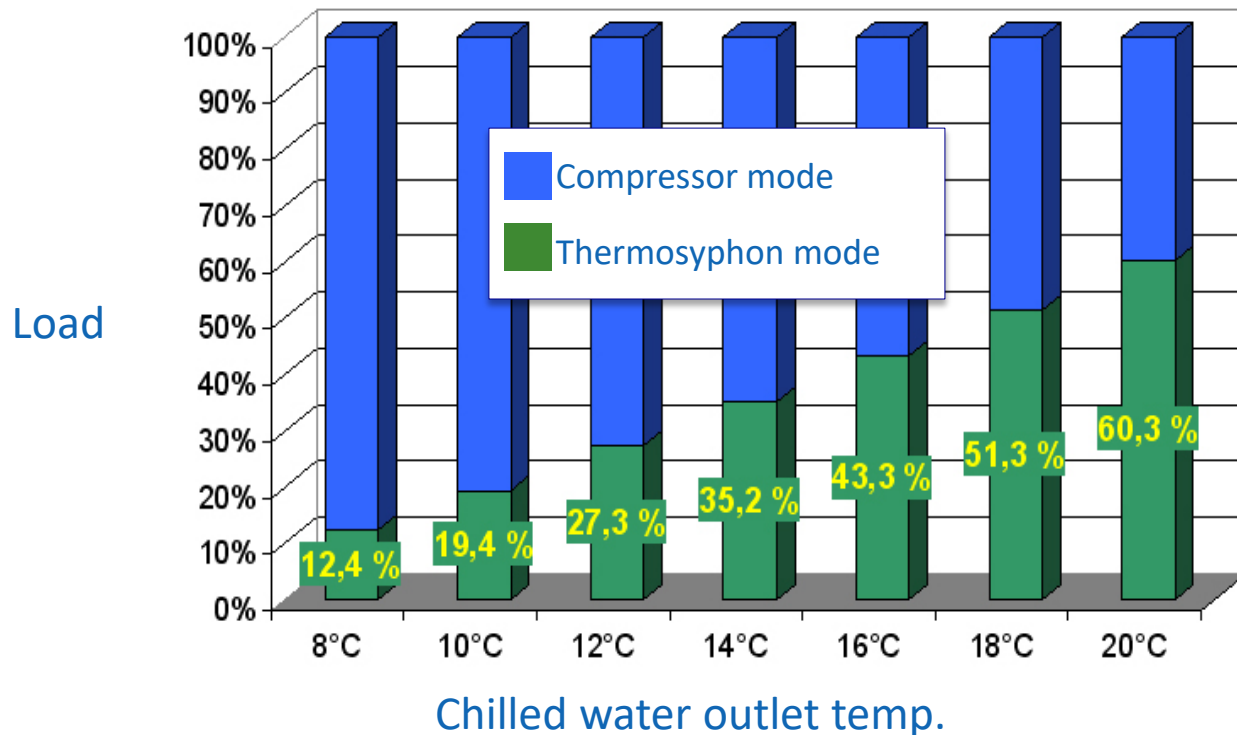
Example Stuttgart

Ambient air temperature of Stuttgart according to
DIN 4710



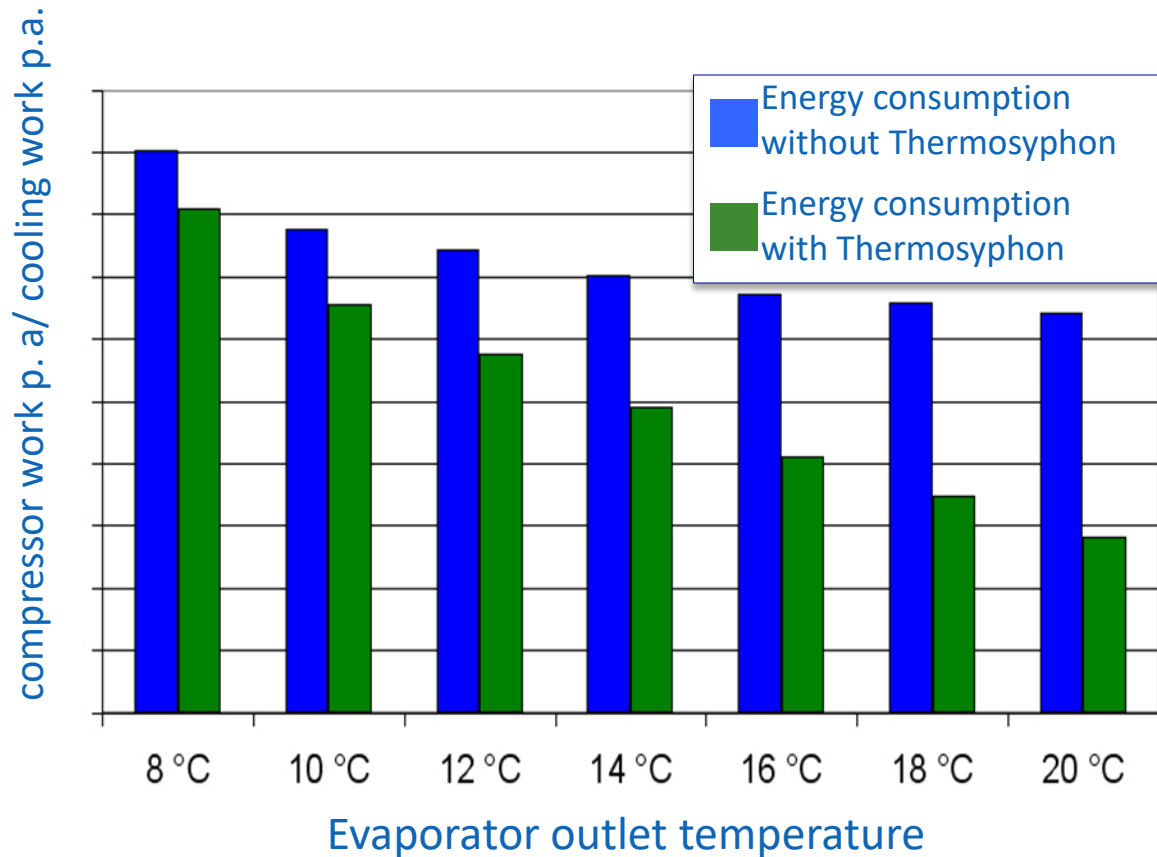
Example Stuttgart

Percentage Thermosyphon free cooling mode



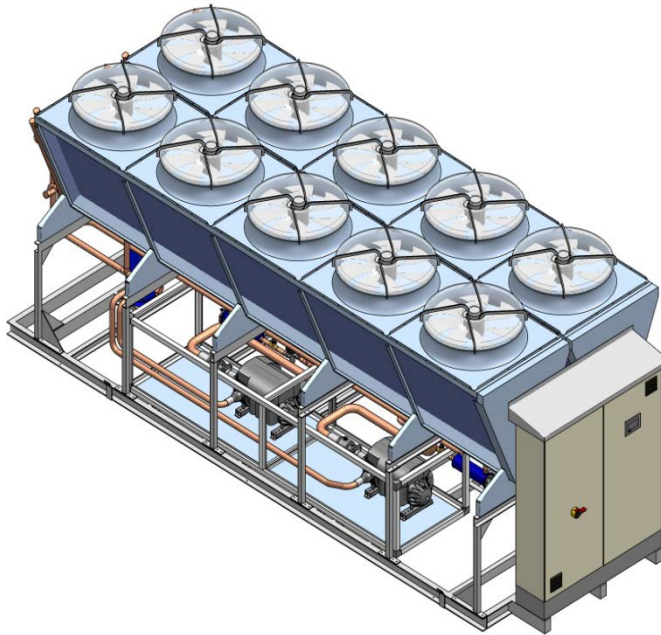
For a ΔT of 10°C between Evaporator outlet temp. and ambient temp.

Energy consumption compressor

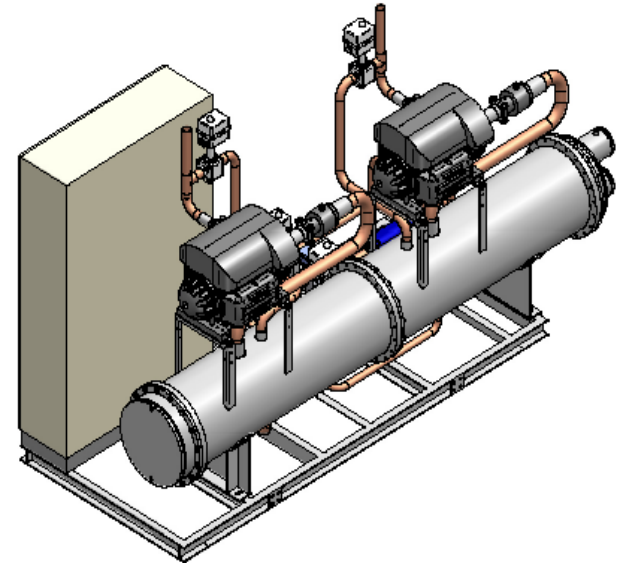


Thermosyphon models

Air-cooled Smardt-Chiller



Split Smardt-Chiller



A blue geometric pattern consisting of overlapping squares and lines, resembling a stylized grid or architectural structure, located on the left side of the slide.

Thank you for your attention!