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Case Studies: Industrial Refrigeration

**Process cooling with a low capacity centrifugal chiller with water as
the refrigerant**

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Case Study: Cooling of a manufacturing process

Key facts:

- Location:
Wolfratshausen, close to Munich, Germany
- Application:
Condensing of solvents
- Cooling capacity:
Up to 20 kW, production related
- Chilled water temperature for the production process:
18 °C constantly
- Outside heat exchanger:
Air cooled dry cooler

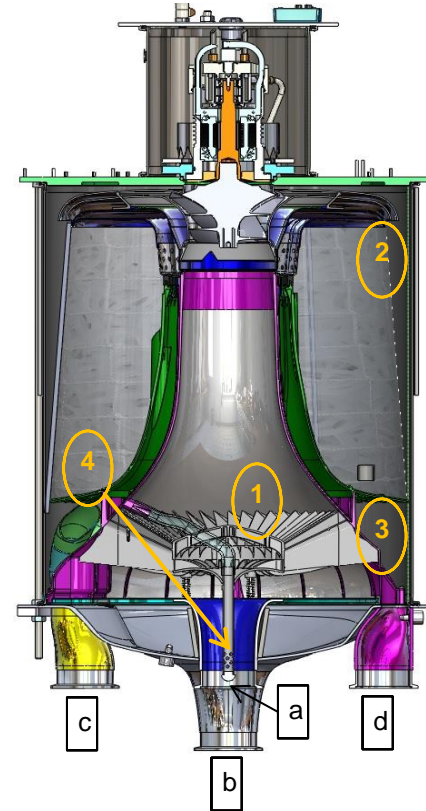
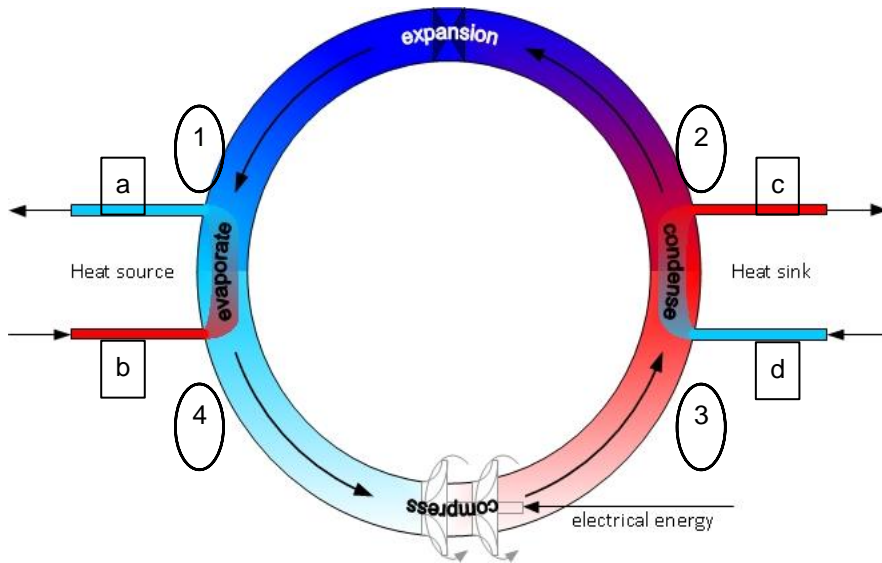


Installed unit – the eChiller

- Efficient system for process cooling
- Water - R718 - as refrigerant
- Operation in vacuum:
between 10 to 150 mbar
or between 0,16 to 2,3 psi
- Operating modes depending on ambient:
 - Free Cooling
 - 1 and 2 stage in cascade,
- Heat sink & source decoupled by BPHX

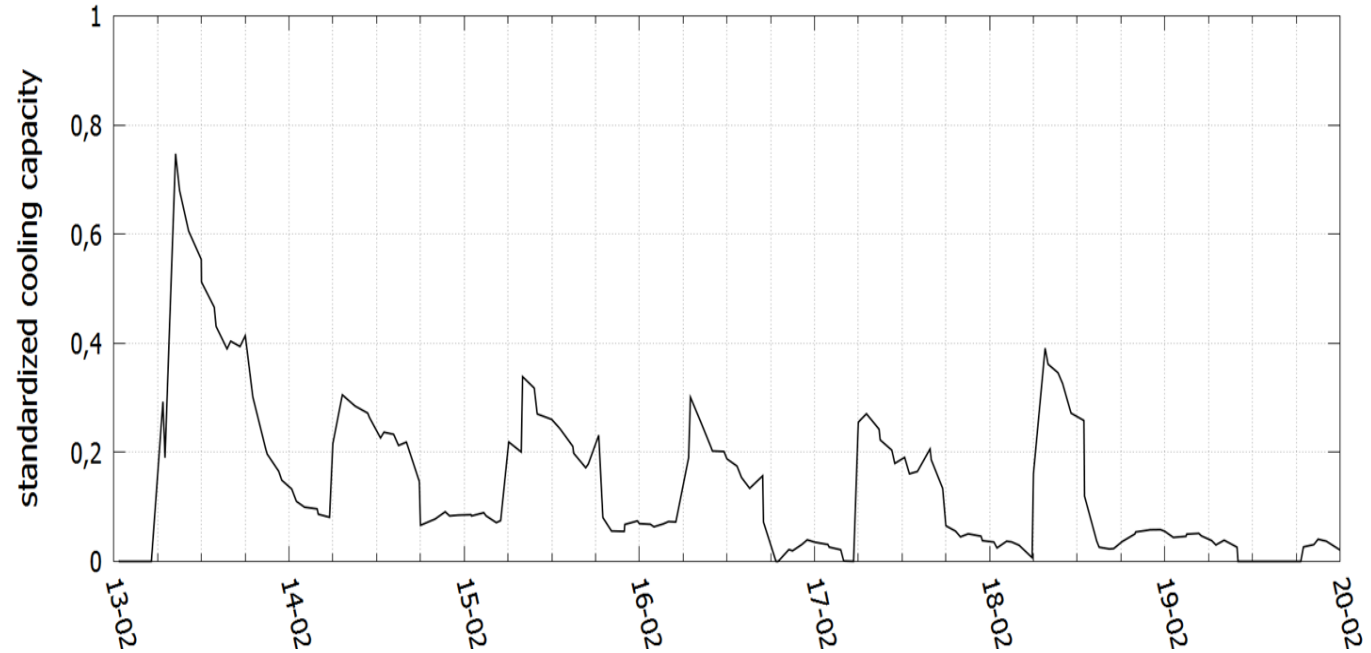


eChiller – the process



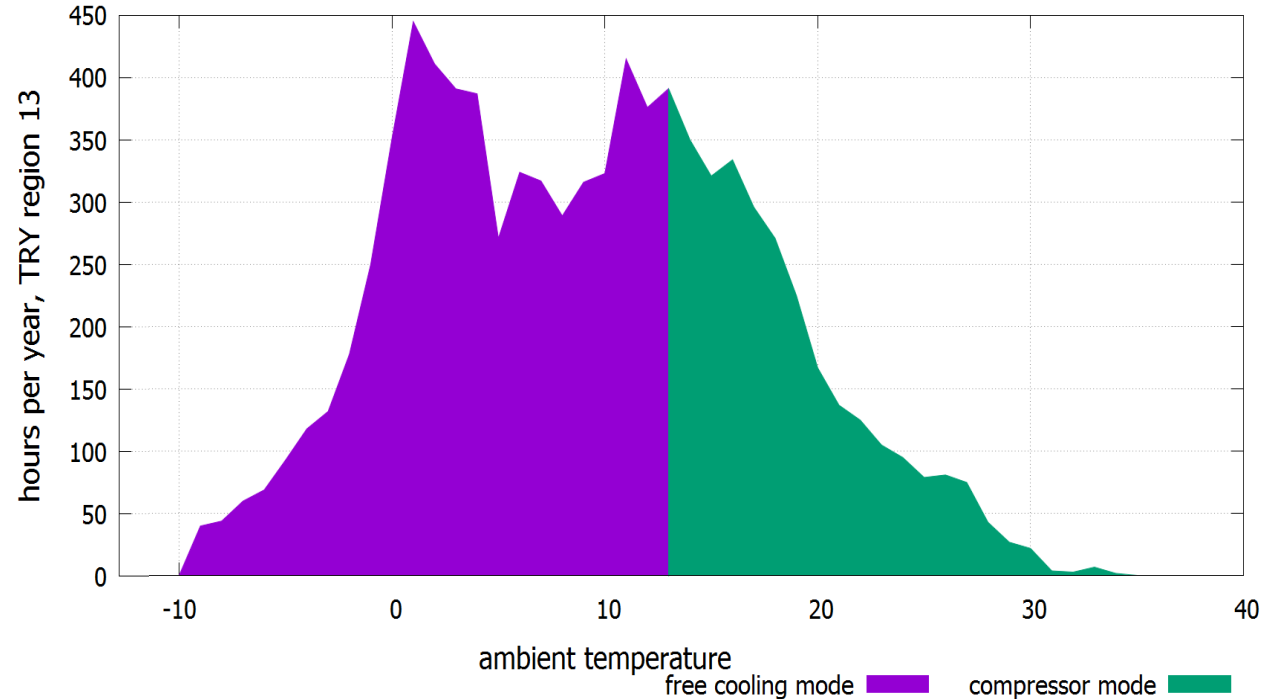
The manufacturing challenge

- Single-shift operation => almost no load during nights
- Changing demand of cooling capacity
 - Peak on Monday
 - lower for the rest of the week
 - Constant chilled water temperature with minimum deviations

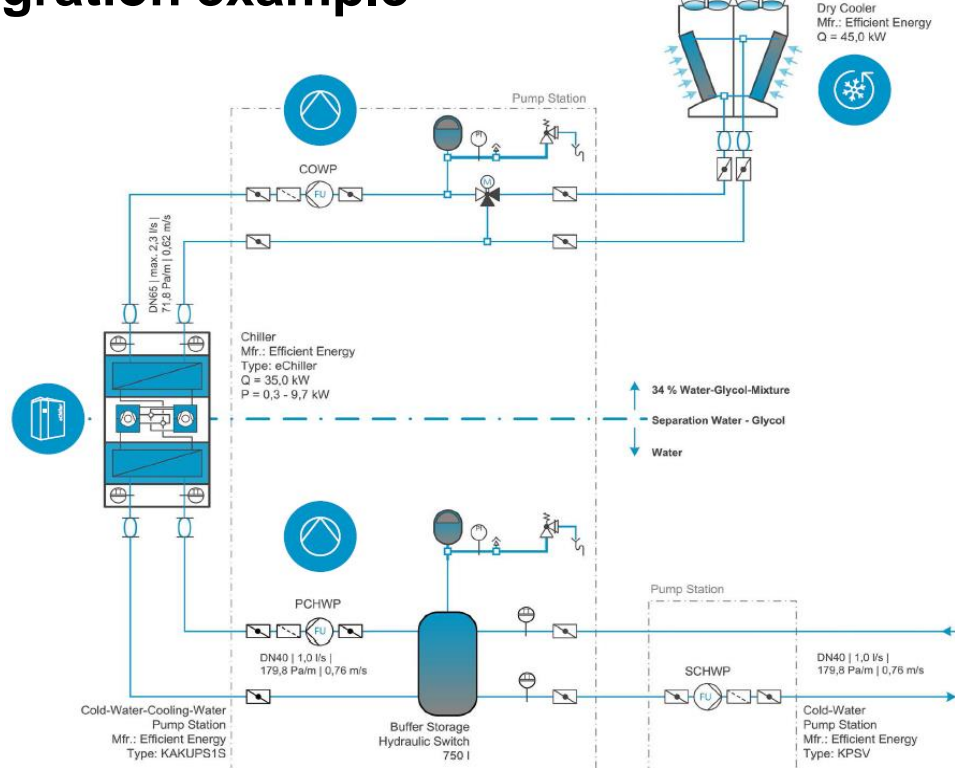


Annual allocation of the operation modes

- 68 % free cooling mode
- 32 % compressor mode



Hydraulic system integration example







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Thank you very much!

