



Screw Compressors for High Temperature Heat Pump Duty



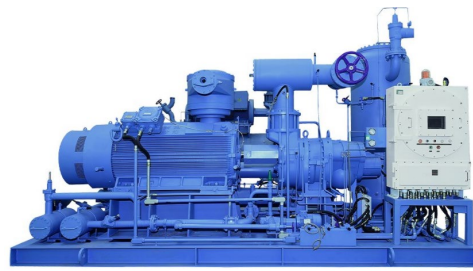
Writer and presenter:

Mats Sundström CTO SRM

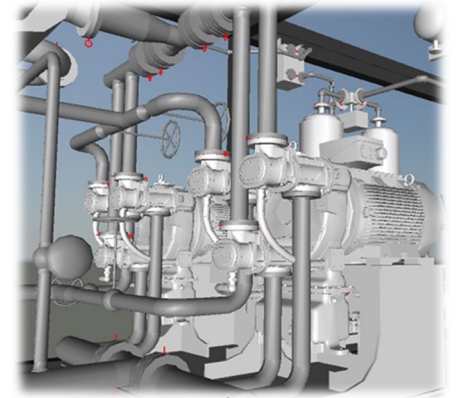
- M.Sc. Mech. Eng.
- Main focus Screw compressors and thermal systems since 1995
- Screw profiles and bearing technology
- Water lubricated
- Fuel cell
- Biogas
- Refrigeration and Heat Pumps
- Steam compression
- Vacuum pumps



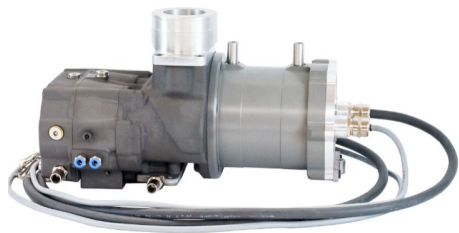
Steam and ORC expanders



Refrigeration and
heat pump



Air cycle refrigeration

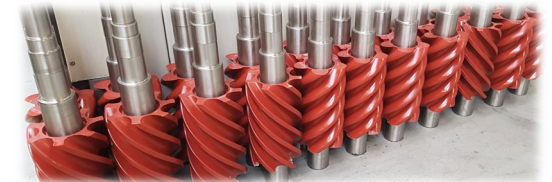


Fuel cell and hydrogen



SRM Engineering Services

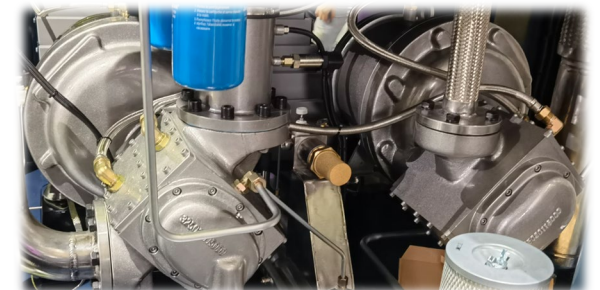
- Compressor development
- Compressor improvement
- Compressor testing
- Supply of special machines



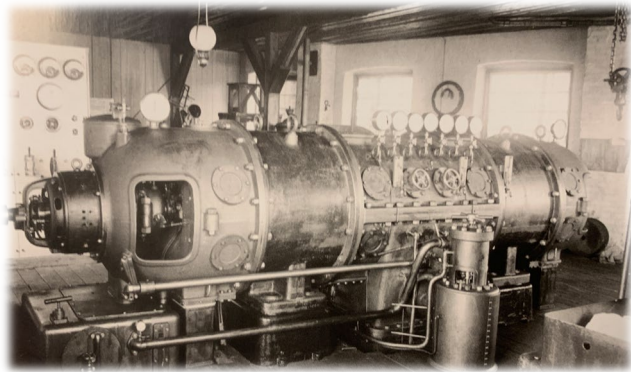
Water lubrication
- Air, biogas and other gases



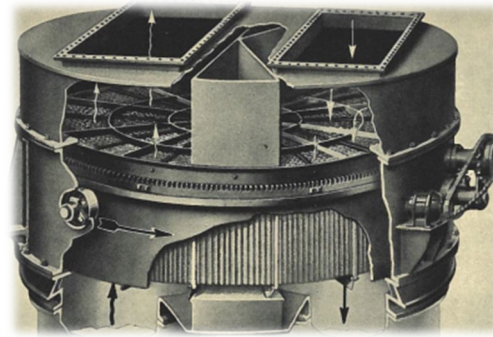
Industrial gases



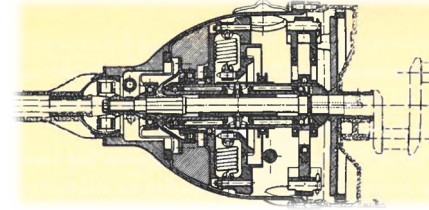
Oil-free air and gas



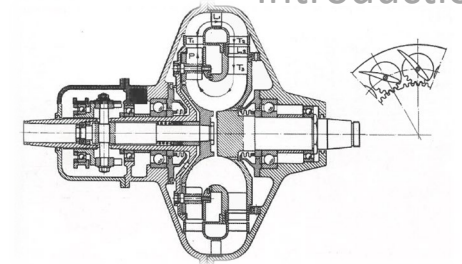
Radial steam turbine [1908]



Air pre-heater[1920]



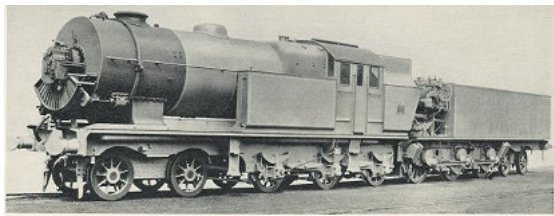
Spontan transmission
[1925]



Hydraulic transmission
[1930]

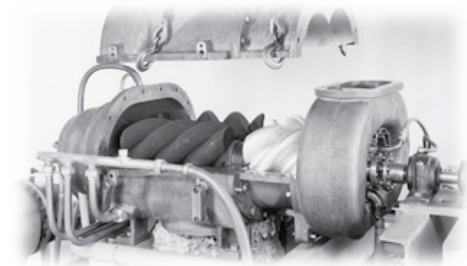
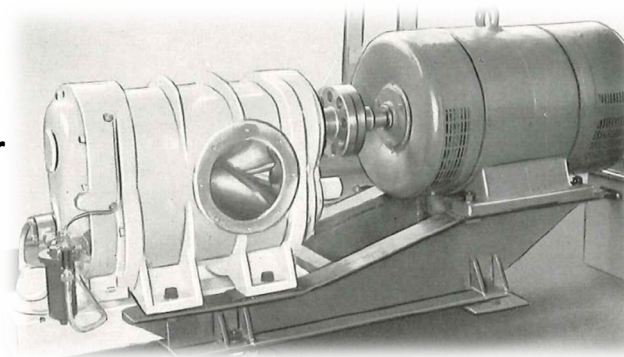
Introduction

SRM inventions - Examples



Steam turbine locomotive[1920]

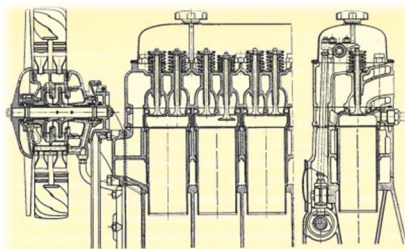
The screw
compressor
[1935]



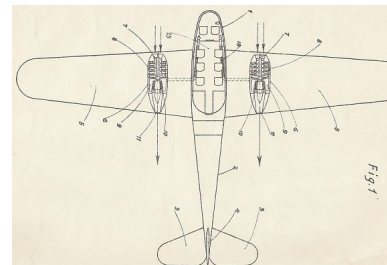
Screw gas turbine [1959]



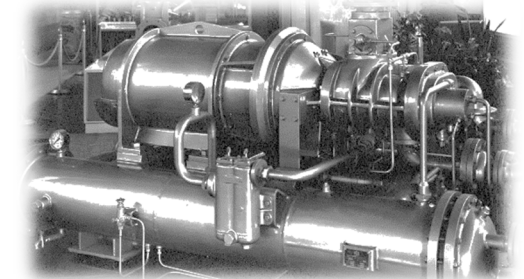
Ljungström car[1920]



Oil cooled engine [1930]



Aircraft gas turbine [1933]

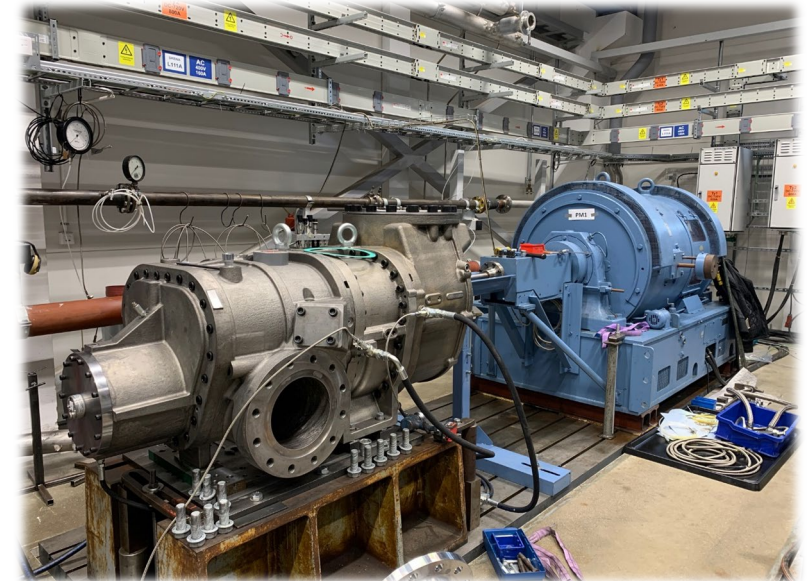
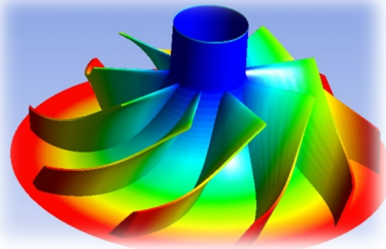
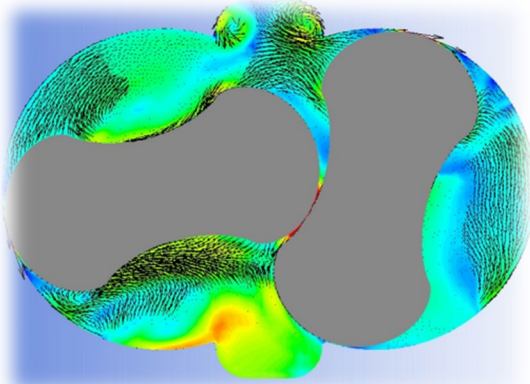
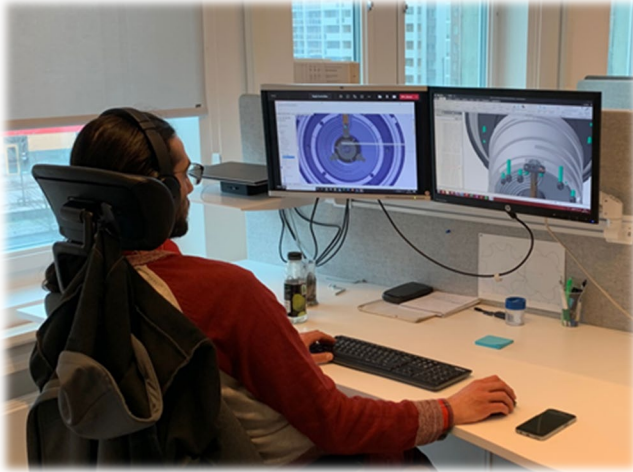


Refrigeration screw compressor
[1950]

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SRM Development center in Stockholm

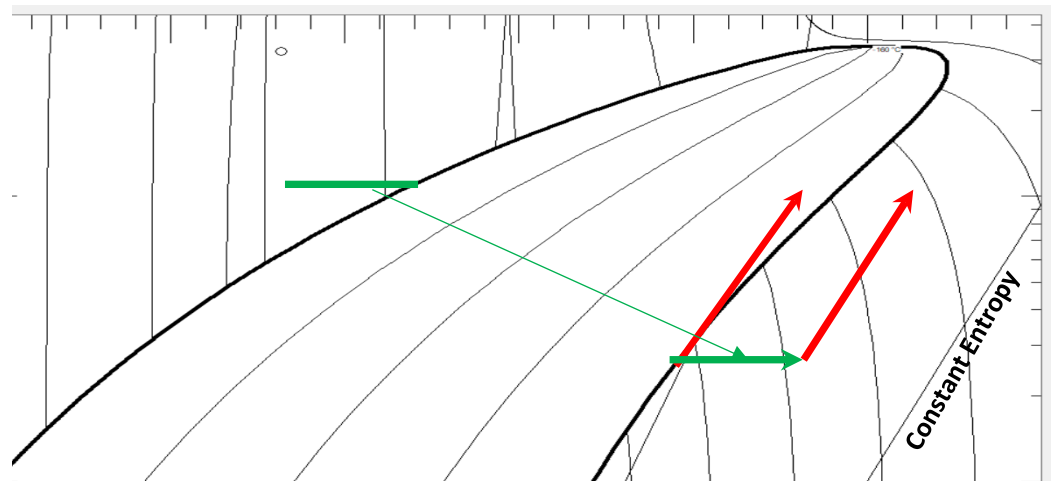
- Engineering
- Prototyping
- Production
- Test



Steam-Generating Heat Pumps, OST Webinar, 29 September 2026

1. Compressor models for
High Temperature Heat Pumps
2. EEETHOS steam compressor
3. RECITHERM heat storage

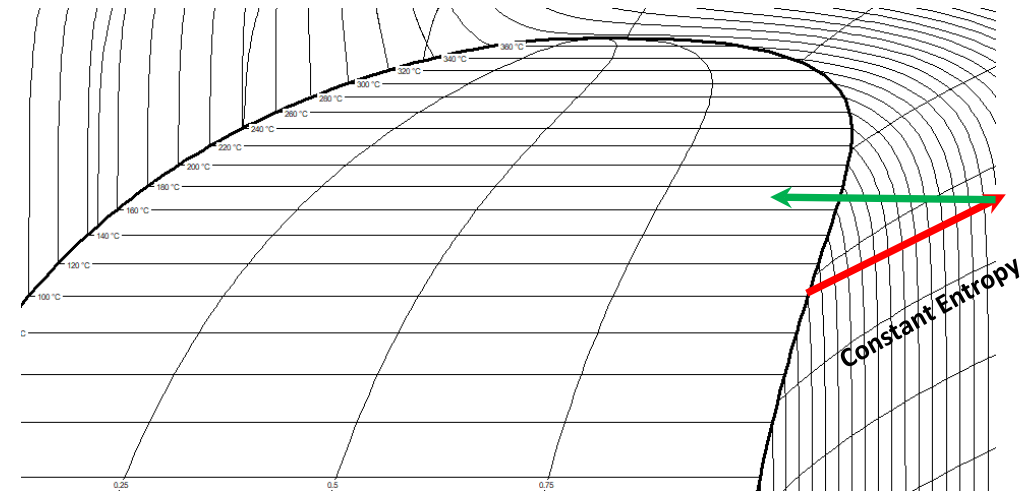
Hydrocarbon refrigerant



Compressor challenges:

- High temperature level
- Low viscosity
- EX

Water – R718



Compressor challenges:

- Efficient liquid injection cooling
- Reliable sealing of steam
- High efficiency



STC – 2 models, 800 and 6300 m³/h
Steam compressors for heat pumps
and MVR



SRH – 9 models, 160 – 2400 m³/h
NH₃ heat pump up to 63 bar



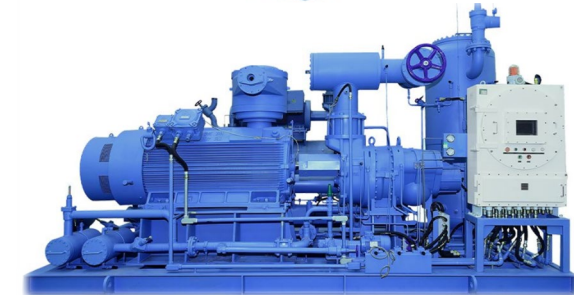
SRM 1-stage –
19 models 260 – 10 000 m³/h



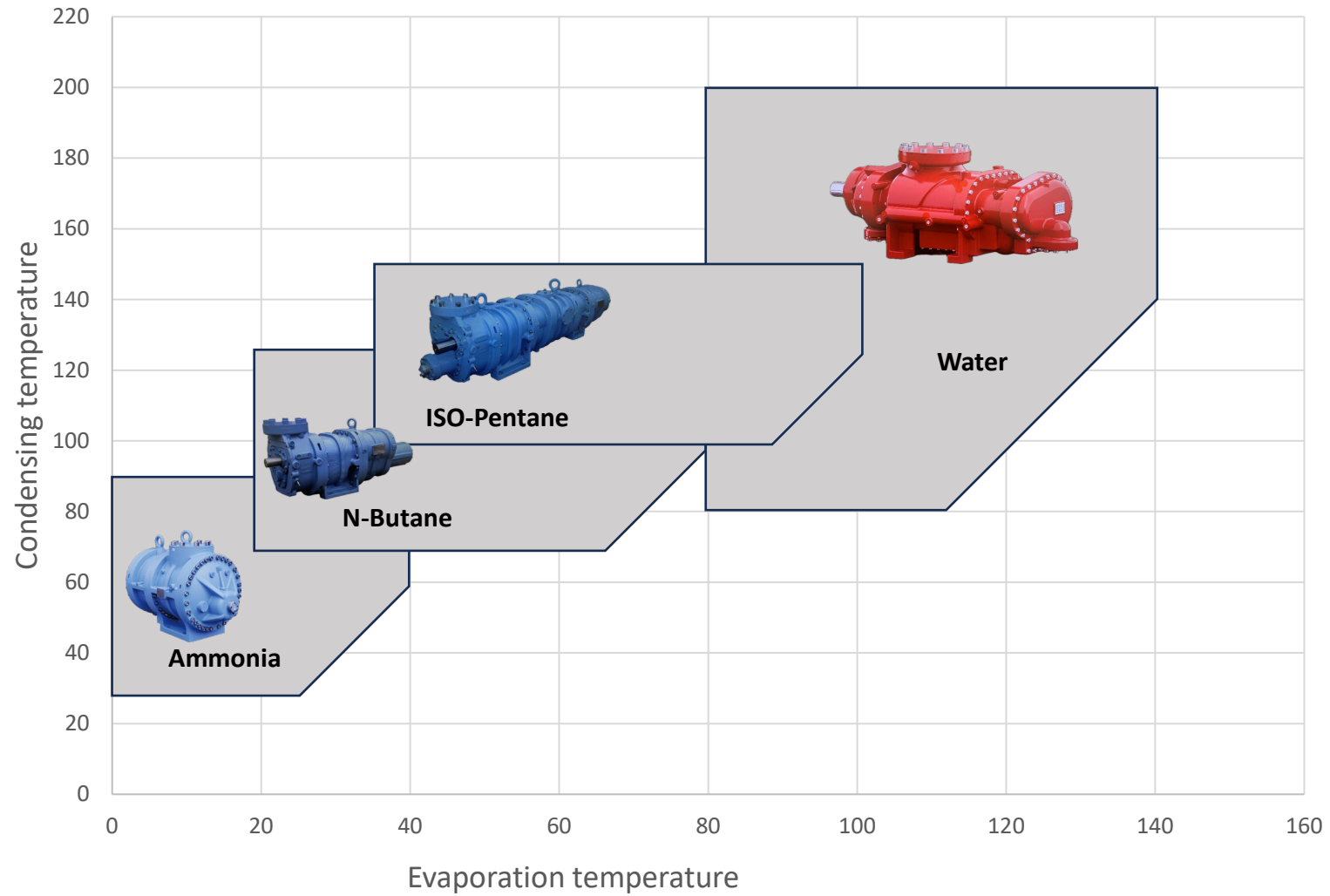
SRM 2stage open type –
32 models, 650 – 6300 m³/h

Compressors for heat pump duty

**Compressor packages
available for all models**



Target refrigerants for HTHP



1. Compressor models for
High Temperature Heat Pumps
2. **EEETHOS steam compressor**
3. RECITHERM heat storage

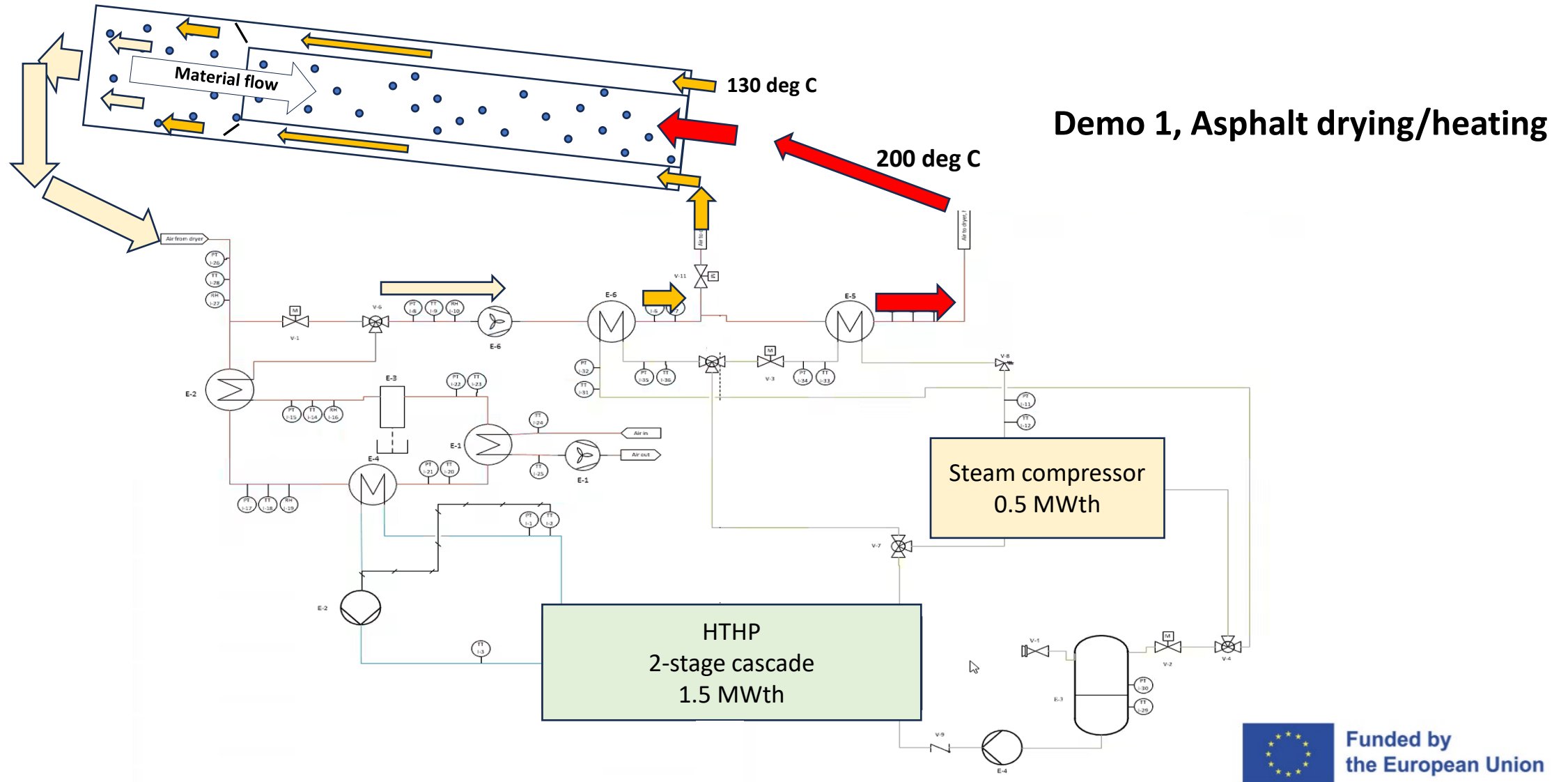
EEETHOS heat pump project

<https://eeethos-project.eu/>

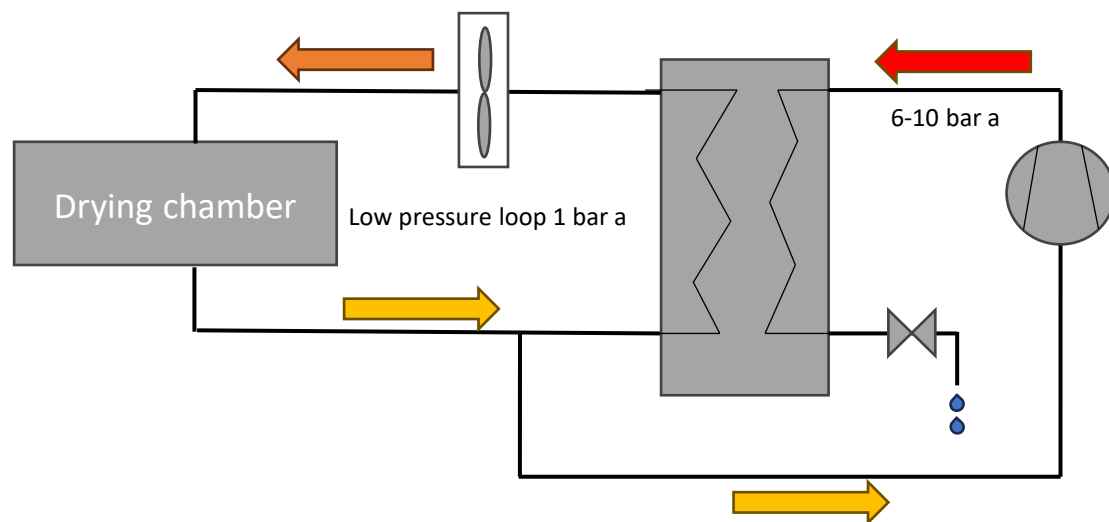


Funded by
the European Union

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Drying with superheated steam

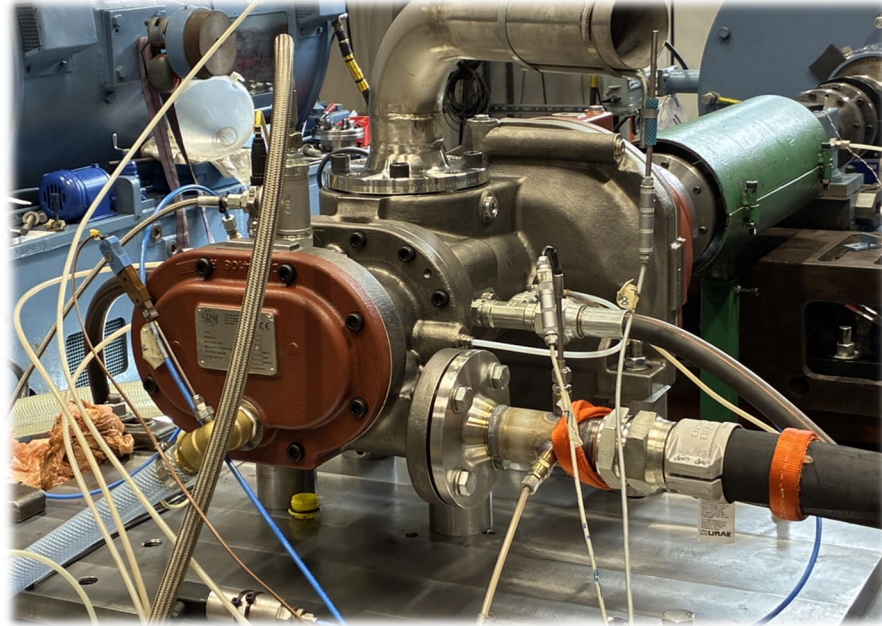


Pilot: 125 kg/h
Real application: 2500 kg/h

- Batch process
- Superheated Steam



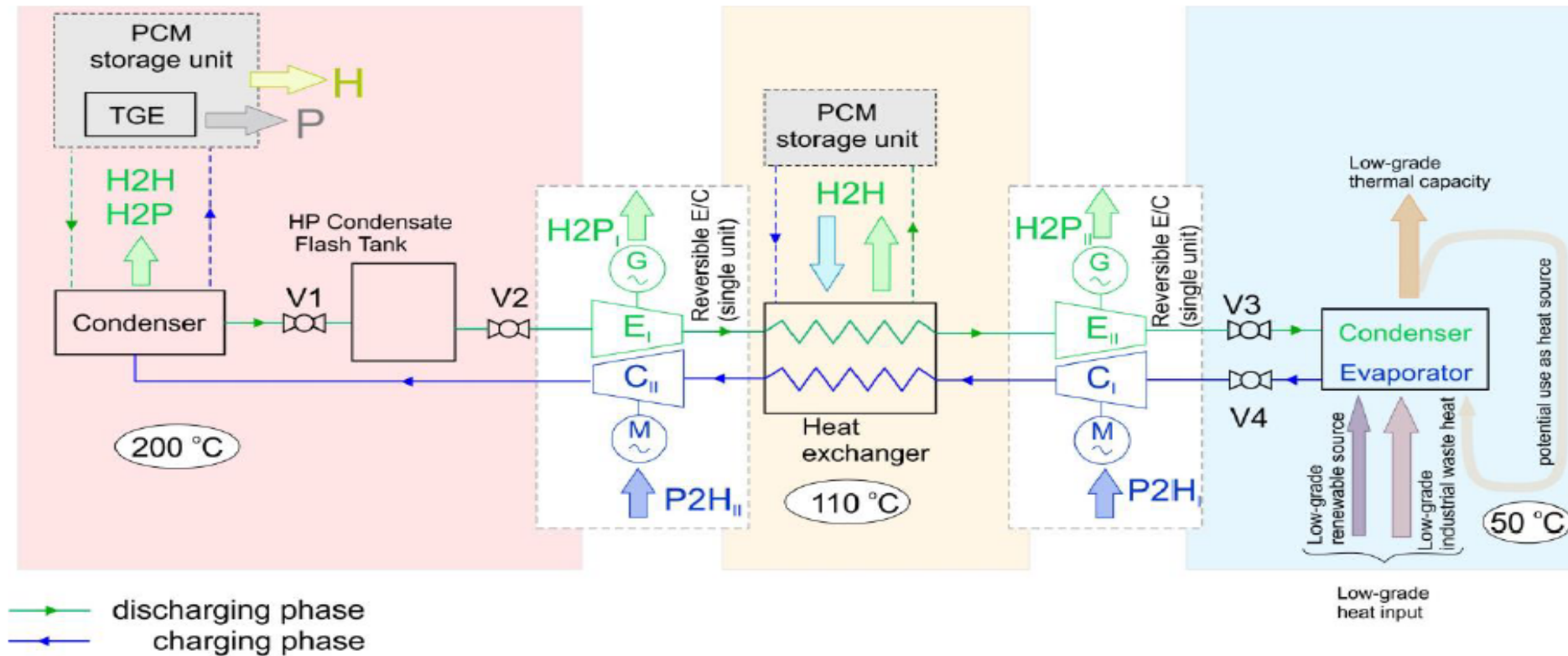
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- Compressor test
- Package test
- Pilot installation



1. Compressor models for
High Temperature Heat Pumps
2. EEETHOS steam compressor
3. RECITHERM heat storage



Summary:

- Natural refrigerants and high temperature => new compressor requirements
- High temperature lift =>
 - 2-stage compressors
 - OR 1-stage HC + steam
- There are many different applications for steam compressors in the range of 130-200 deg C
- Energy storage with steam will be investigated in the RECITHERM project.



Talk to us about
compressors

www.rotor.se