the refrigeration cycle

pressure-enthalpy diagram (ideal)

A → B evaporation
Isothermal and isobaric evaporation

B → C compression
Isotropic compression (ideal)

C → D condensation
Isobaric subcooling to saturated liquid

D → A expansion
Isenthalpic expansion over valve (temperature drop)

Critical point

Isotherms

Saturated vapour line

CONDENSATION

EXPANSION

COMPRESSION

EVAPORATION

Saturated liquid line

Constant quality fraction

Constant entropy lines

pressure / **enthalpy**

temperature-entropy diagram (non-ideal)

CONDENSATION

COMPRESSION

EXPANSION

EVAPORATION

P_{max}

P_{min}

T & P loss

slightly subcooled at condenser outlet

expansion will drop pressure and increase entropy

compression not perfectly isentropic

T & P loss

slight superheat at compressor inlet

temperature / **entropy**

version 2 (2024-12-20)