Practical experience with a centralized 3 stage NH_3 DX-plant

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eurammon Symposium, 26 – 30 June 2023

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refrigerants delivered by mother nature

Agenda

- Company profile
- The plant
- General argument topics pump to DX system
- Design considerations

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Profil D+B

KÄLTETECHNIK
DRESEN + BREMEN GMBH

D+B

Mittelständiges Familienunternehmen

120 Mitarbeiter

Tradition und Expertise seit über **35** Jahren

Ausbildungs- und Weiterbildungsbetrieb

Investitionen in eigene Innovationen

Vollumfängliche Kundenbetreuung

Einsatz von umweltfreundlichen natürlichen Kältemitteln **NH_3** und **CO_2**

24/7/365 Notdienst

Profil D+B

KÄLTETECHNIK
DRESEN + BREMEN GMBH

Nahrungsmittel

- Schlachthöfe
- Verarbeitung

Getränkeindustrie

- Brauereien
- Molkereien

Kühlhäuser - Logistik

- TK-Lager
- NK-Lager
- Verteilung NK/TK

Froster

- Schockfroster
- Palettenfroster
- Plattenfroster
- Spiralfroster

Planung

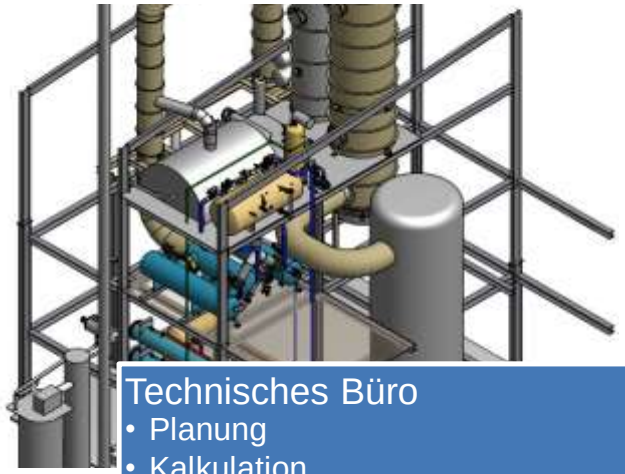
- Entwurfsplanung
- Ausführungsplanung
- Genehmigungsunterstützung

Sonderanlagen

- Absorber NH3-H2O
- ATEX Ausführung
- Getriebeschraube mit Gasmotoren

Profil D+B

KÄLTETECHNIK
DRESEN + BREMEN GMBH



Technisches Büro
- Planung
- Kalkulation
- Abwicklung

Leitungs-/Stahlbau
- Einbringung und Montage
- Leitungstrassen
- Gestelle und Geländer

Service- und Wartung
- Inbetriebnahme
- Inspektion, Wartung und Reparatur
- Fernwartung

Elektrotechnik
- Planung
- Programmierung
- Visualisierung

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The plant

The beginning of the project:

- Project started as a tender
- 3 stage centralized ammonia liquid pump design
- Quotation of tender and an alternative with DX

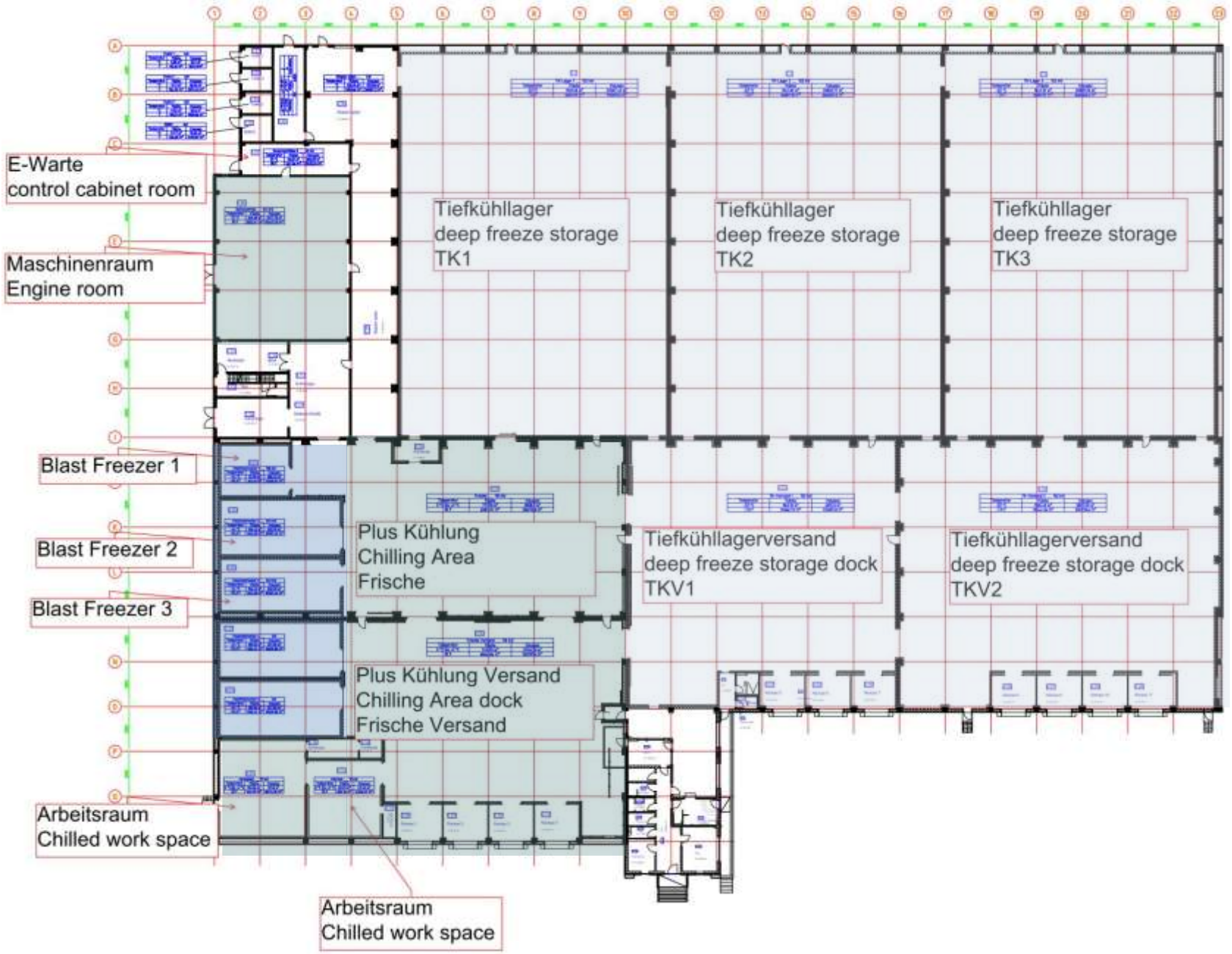
The plant

Basic information:

Evaporation temperature	Room volume	Cooling capacity
• -10°C (+14F) • -32°C (-25F) • -42°C (-44F)	• 10.620m³ (374.800 ft³) • 80.840m³ (2.855.000 ft³) • 1.345m³ (386.000 ft³)	• 484kW (136TOR) • 760kW (215TOR) • 615KW (174TOR)

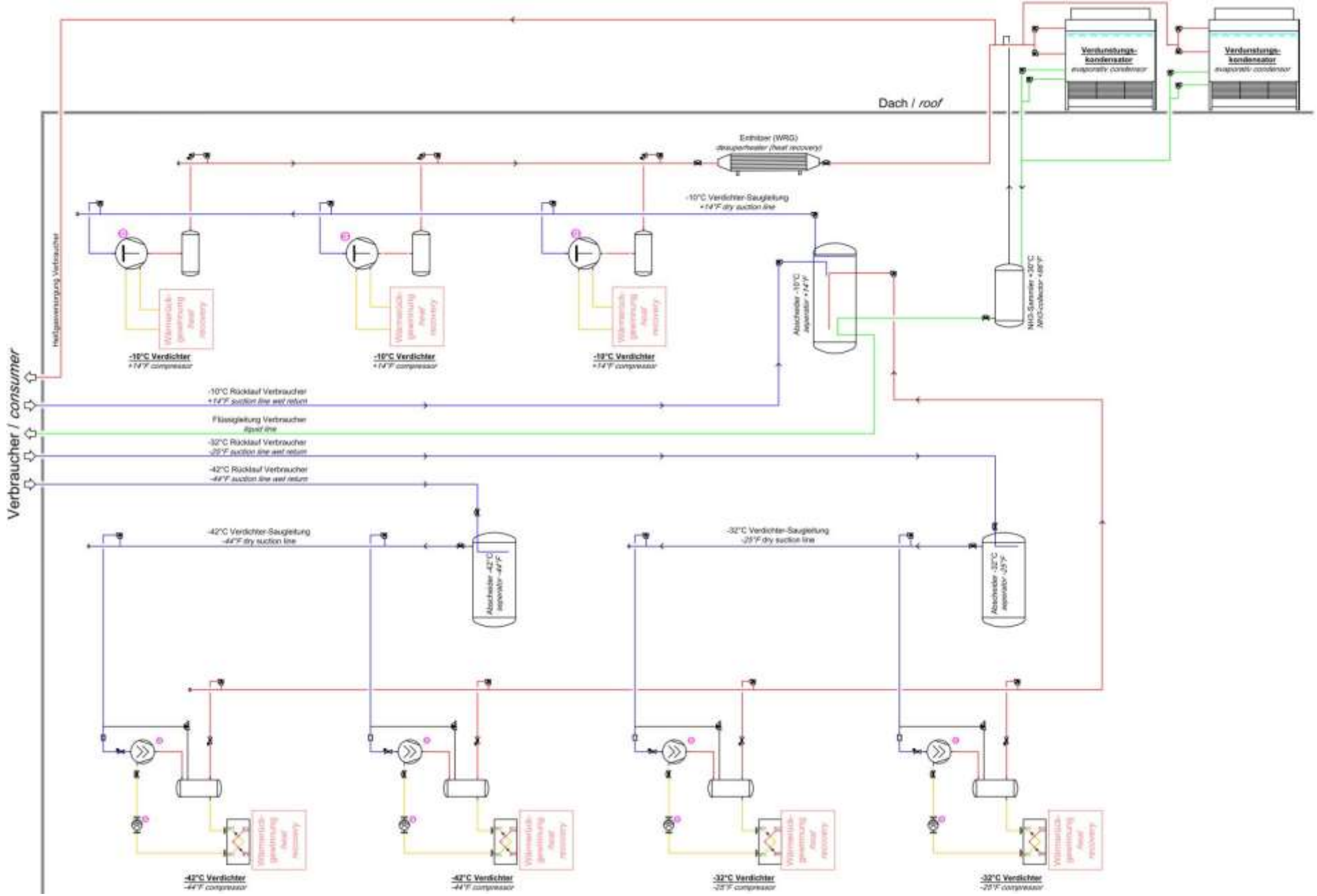
The plant

Layout



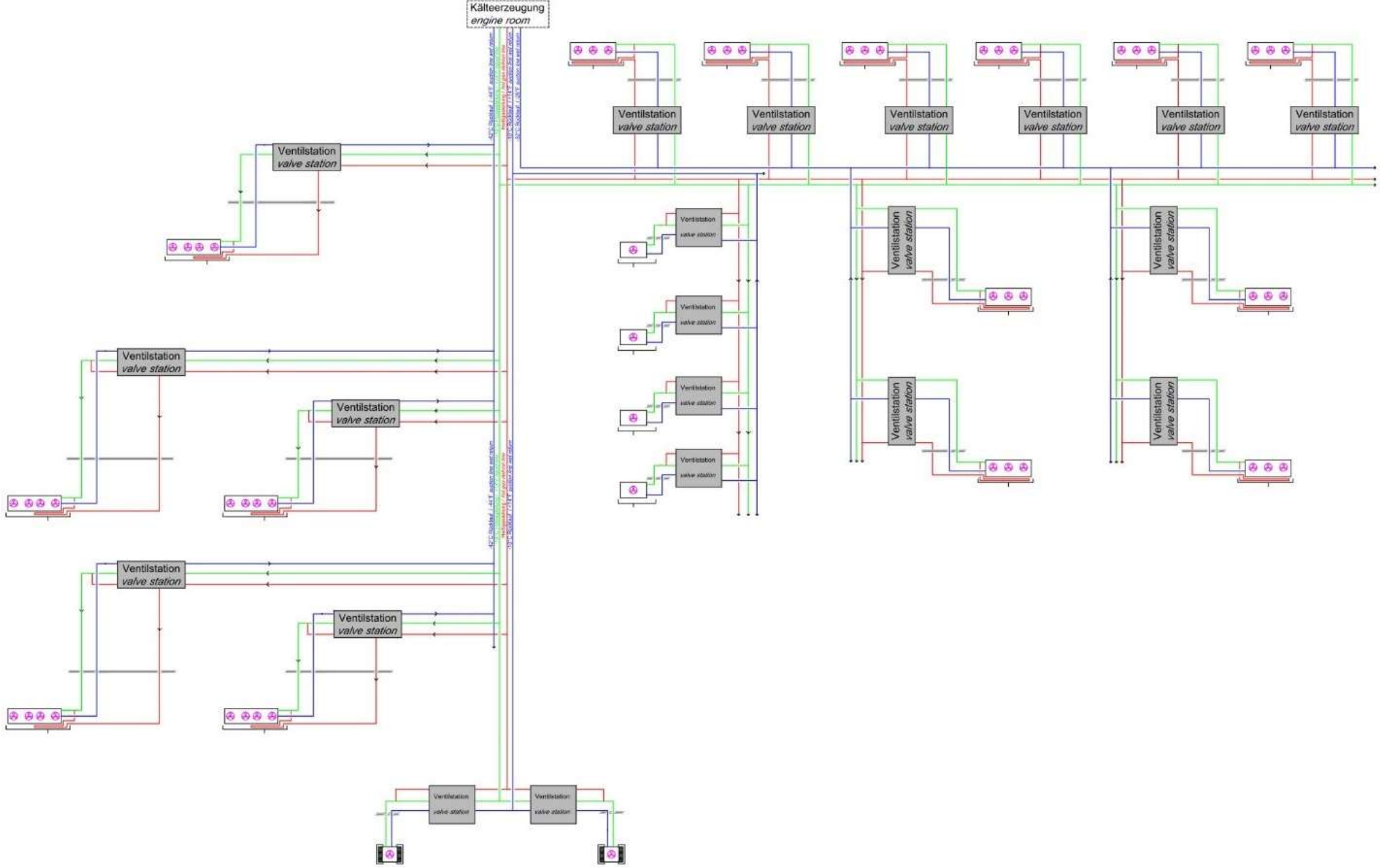
The plant

P&ID



The plant

P&ID



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- **General argument topics pump to DX system**
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General argument topics pump to DX system

Number	Topic	Argument
1	DX more efficient	No ammonia pumps Dry suction riser Smaller pipe dimensions
2	Liquid management	Where to place the liquid Seperator or overheat
3	Defrost	Hotgas -> liquid manag. Elektrik Water or other
4	Cost benefit	Investmentcost higher Operationacost lower

General argument topics pump to DX system

Number	Topic	Argument
5	Operational cost savings	Comparing concepts Comparing plants SEC
6	Energy saving	15%+ possible
7	Measurng energy	Not possible for 2 phase fluids
8	Refrigerant charge	Reduction from 5 to 2,2t

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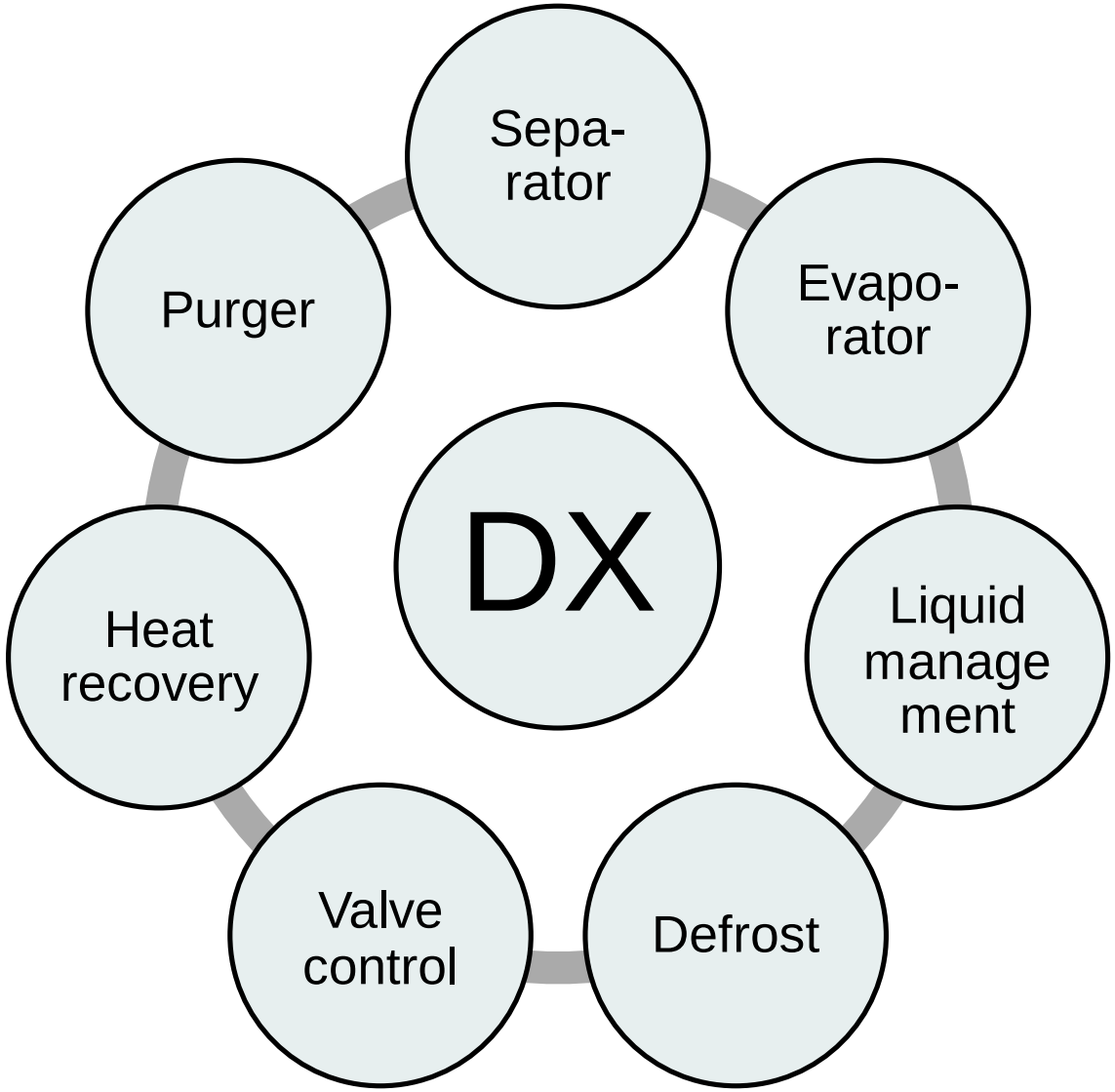
Design considerations



Design considerations

Evaporator

- Material mix
- Overheat
- Refrigerant in / out position
- Sensor position
- Hotgas defrost
- Refrigerant distributor

Design considerations

Liquid management

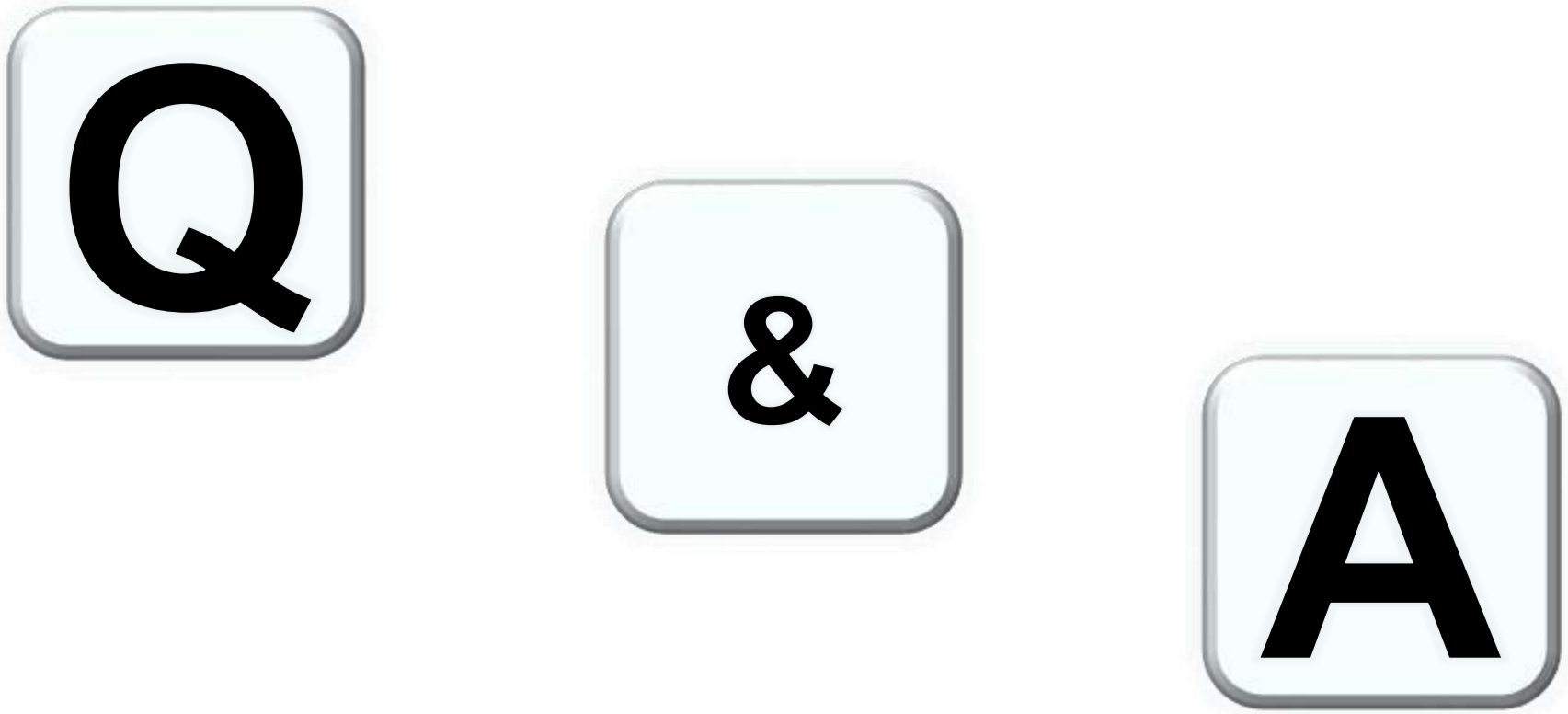
- Hotgas condensate
- Condensate due to pressure changes
- Evaporator start up liquid
- Condensate due to still stand in cold surroundings

Design considerations

Valve control

- Overheat control
- Moist control
- Liquid feed control
- Evaporator start up
- Multiple sensor
- Cooling restart after defrost

Q&A



eurammon e. V. is always available as a sparring partner for questions on refrigeration with natural refrigerants.

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