COOLING CONTROL

My Fruit
The Best Fruit

VAN AMERONGEN CA technology

Version 2024-01

Unique reasons for combining Cooling & CA control in My Fruit

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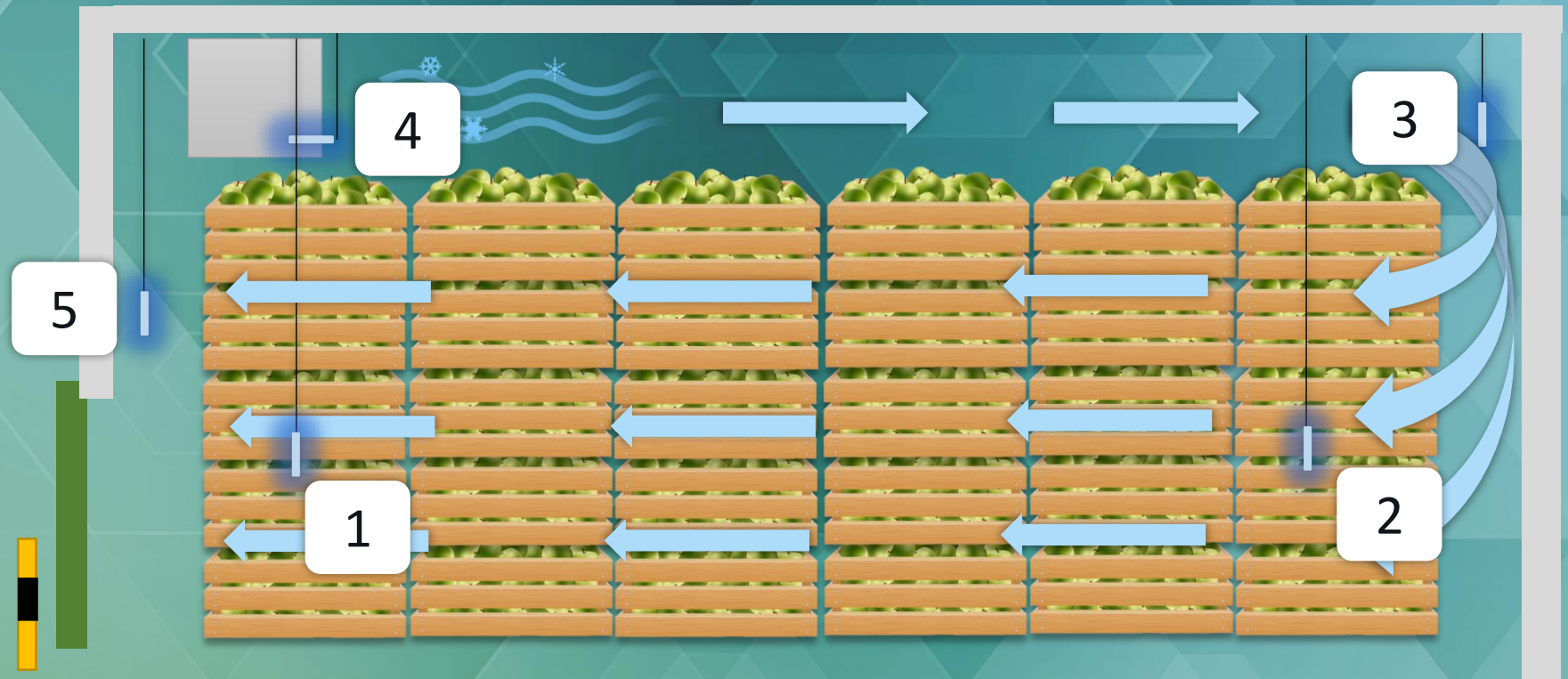
CA:	Inseparable combination with Control of Temperature & Atmosphere in fruit storage
Storage condition:	Every product has its specific optimal Temperature and Controlled Atmophere conditions determined experimentally and based on practical experience
Storage protocols:	Bringing together storage conditions, postharvest technique and operational rules in one protocol, to ensure optimal fruit quality during the long-term storage period
Our goal:	• Optimal control of fruit quality by best storage conditions • Secure operation • Minimal usage of energy and maintenance cost
My Fruit control:	The intelligence to measure, control and give insight for the technology of Temperature and Controlled Atmosphere in favor of the product and for relieve of the cold store manager

100 % control at room level condition

- My Fruit can control all different types of cooling systems : Direct Expansion and (In)Direct Pumpsystems
- Multiple PT-1000 sensors for optimal cooling control (Customized sensor names)
- Additional sensors (RH, Pressure, Refrigerant, condense water loss, door status, fan status, …)



Temperature sensor

1. Warmest product
2. Coldest product
3. Safety or supply air (optional)
4. Defrosting
5. Start/Stop

MyFruit control of different types of cooling systems on room level

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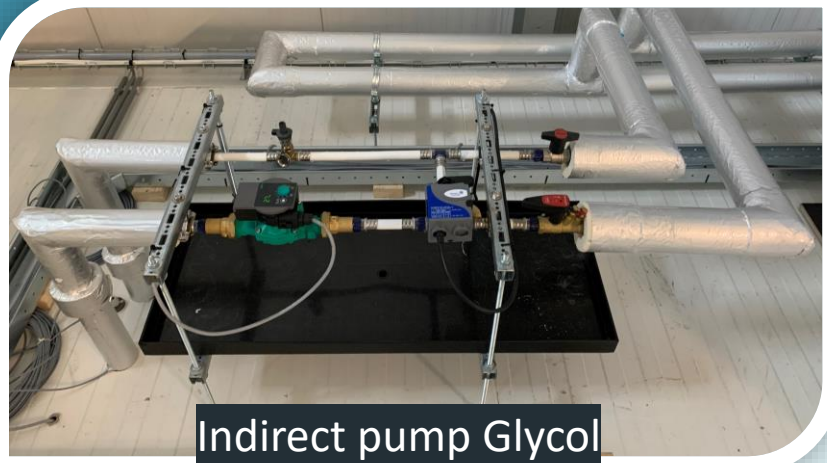
Direct expansion systems and direct pump systems (freon, propane, CO2, ammonia)

- Cooling valve
- Evaporation pressure
- Suction valve
- Defrosting by hot gas, electric or warm glycol

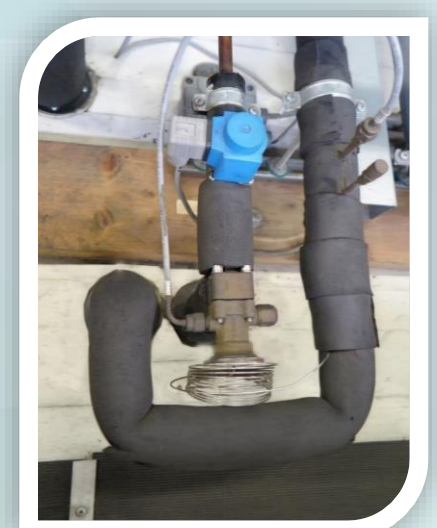
Indirect pump systems (freon-glycol, propane-glycol, propane-CO2, ammonia-glycol, ammonia-CO2)

- Temperature control incoming glycol
- Mixing valve control
- Defrosting by warm glycol or electric

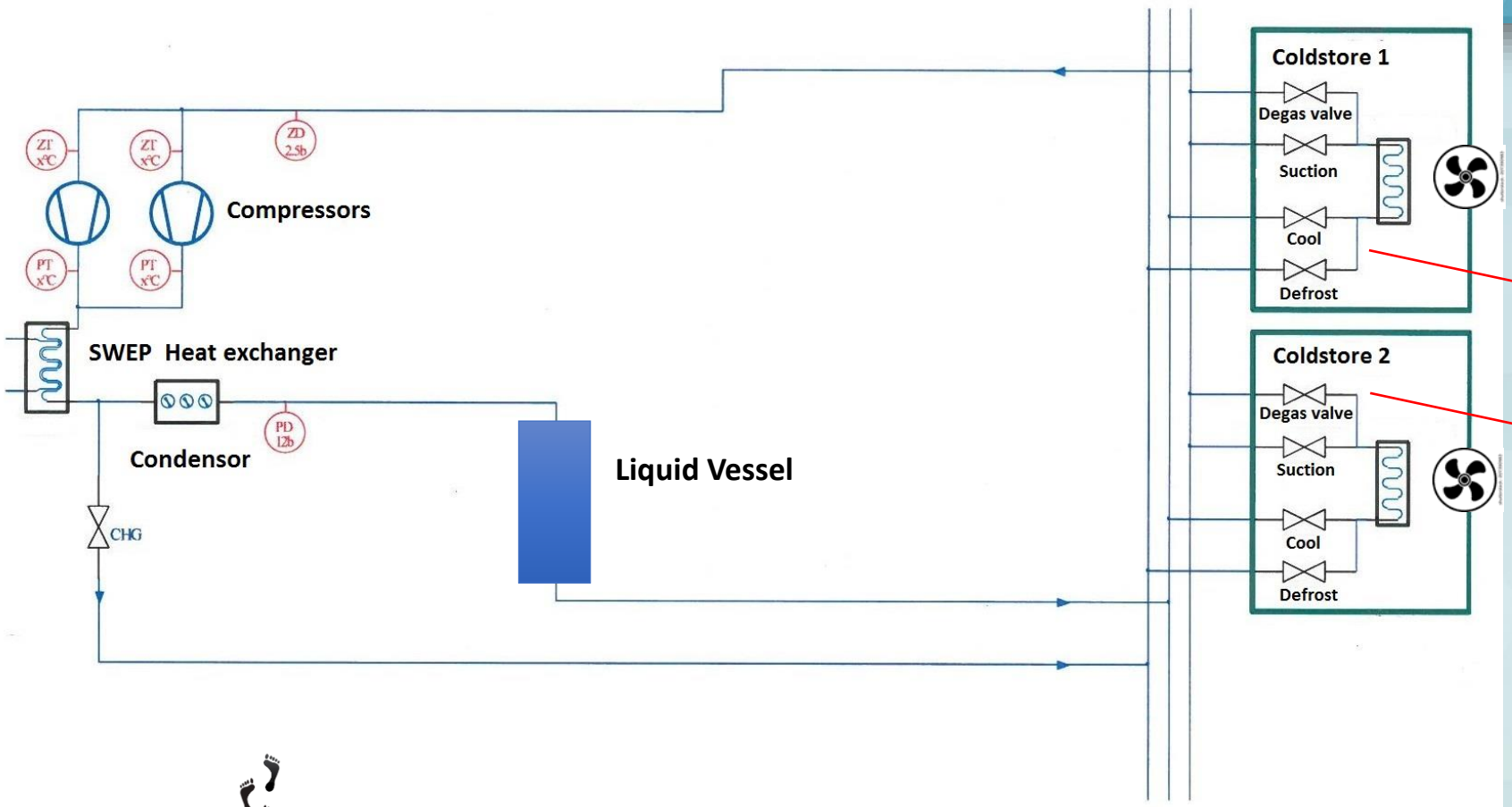

CO2-pump


Indirect pump Glycol


Ammonia direct pump


Direct expansion Freon

Direct Expansion (freon)

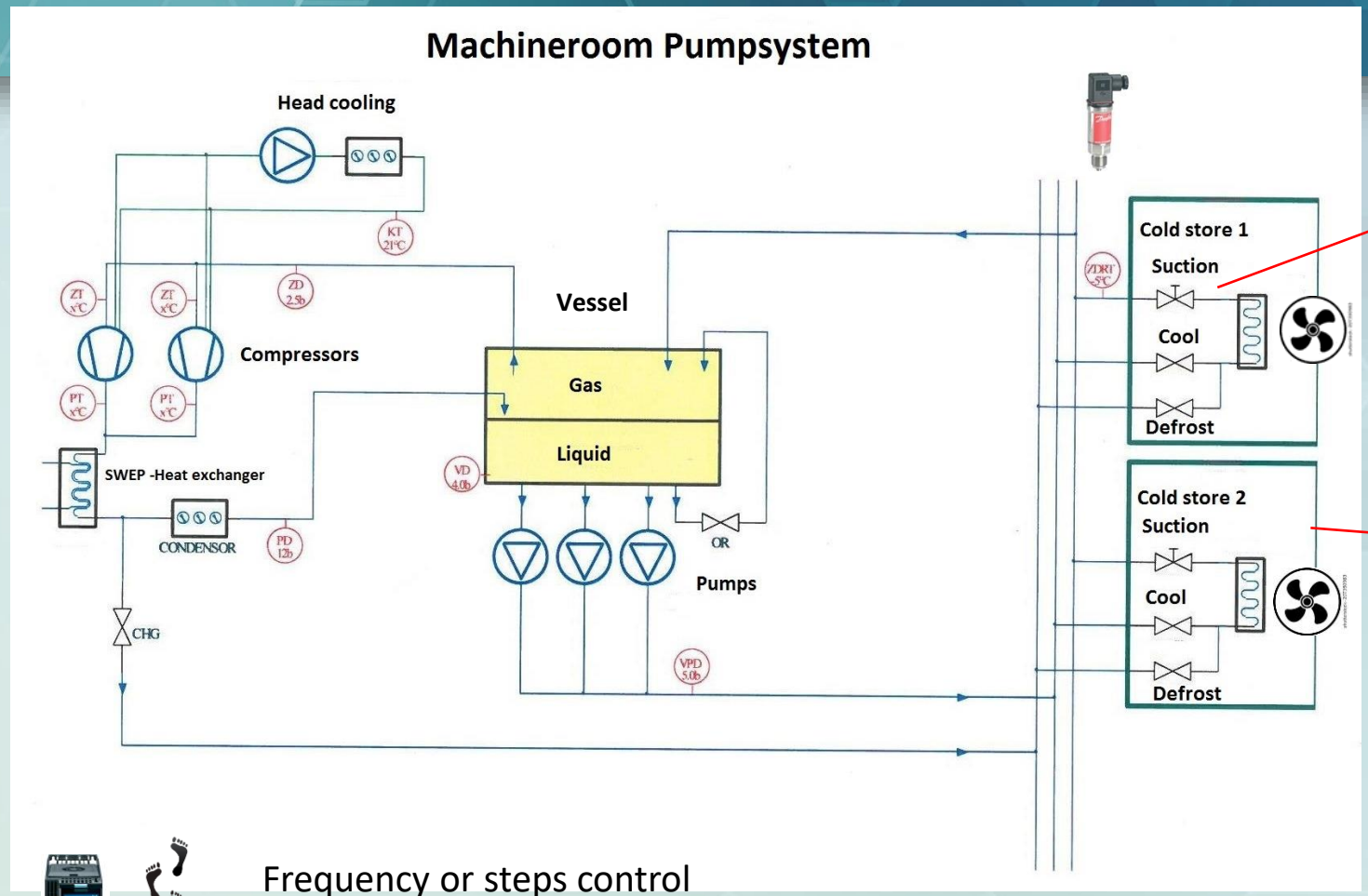


Expansion valve
- Thermal
- Electronic

Temperature sensors
- Fixed sensor
- 1 or 2 Defrost sensors
- 1 pilot sensor
- 1 exhaust sensor
- 1 to 10 product sensors

Frequency or steps control
Compressor, condensor, pump and fans.

Direct Pump (ammonia)

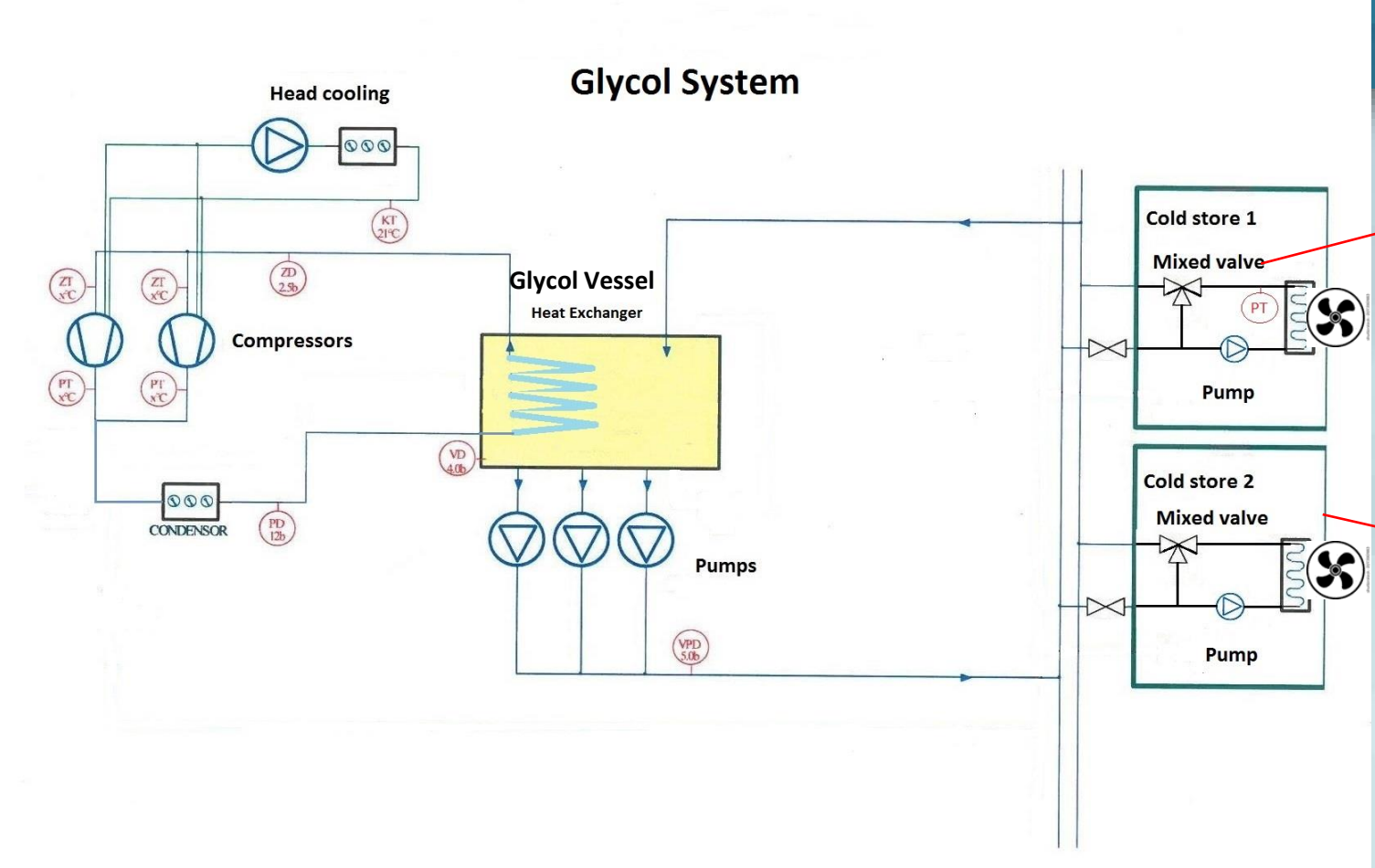


Kornwestheim valve
Analog signal 4-20mA

Temperature sensors
- Fixed sensor
- 1 or 2 Defrost sensors
- 1 pilot sensor
- 1 exhaust sensor
- 1 to 10 product sensors

Frequency or steps control
Compressor, condensor, pump and fans.

Indirect Pump (glycol)



Temperature sensors

- Fixed sensor
- 1 or 2 Defrost sensors
- 1 water sensor
- 1 pilot sensor
- 1 to 10 product sensors

Frequency or steps control
Compressor, condensor, pump and fans.

Cooling Control & Energy Management

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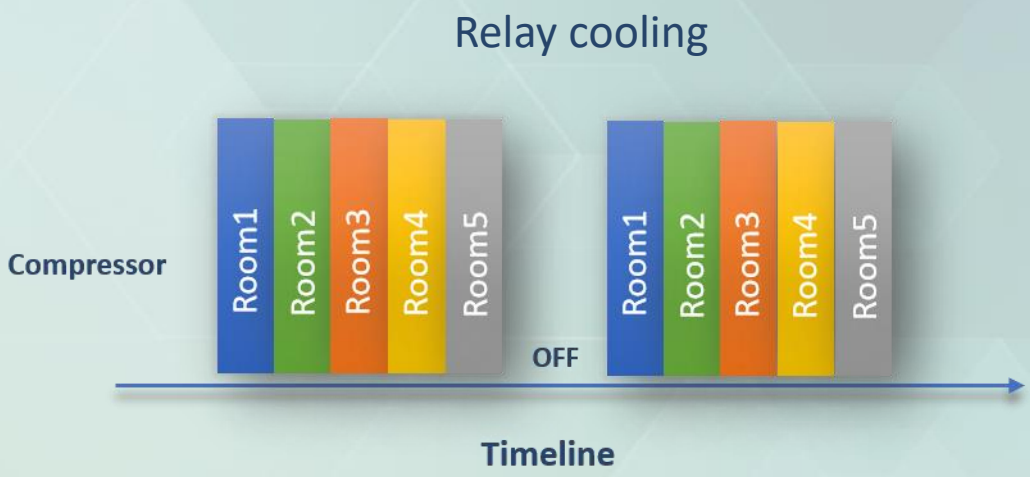
2 ways to start cooling during the storage period

- Δ Delta Temperature
  Target temperature – Measured temperature
- Relay cooling
  A group of rooms start cooling based on interval time one by one and each room uses the compressor (frequency controlled) in the most efficient way (ENERGY SAVING)

Innovative Energy Management (IEM)

- Advanced control of circulation
- Smart Cooling: based on power-consumption, solar-cooling during daytime, low-price energy, etc.
- Auto Defrosting: interval measurement of coil temperature
- Machine room: compressor & condenser control the needed capacity for cooling & protection of technical parts of the compressor
- Respiration/heat-production control: Active Control of Respiration (ACR)



Options

Sensoring		System		
		Direct expansion	Pump direct	Pump indirect
Room	Control T sensor	X	X	X
	Defrost T sensor	X	X	X
	Exhaust T sensor	X	X	X
	Pilot T sensor	X	X	X
	Product T sensor 1..10	X	X	X
	Evaporation pressure / temperature	X	X	X
	Refrigerant leakage sensor	X	X	X
	Defrost water volume	X	X	X
	Door status	X	X	X
Refrigeration plant	ionSuction pressure	X	X	X
	Pump pressure		X	X
	Condensing pressure	X	X	X
	Hot gas temperature	X	X	X
	Machineroom temperature	X	X	X
	Ambient T sensor	X	X	X
	Head / oil temperature		X	(X)
	Refrigerant level	X	X	X
	Refrigerant leakage sensor	X	X	X
	Secondair coolant supply temperature			X
	Secondair coolant return temperature			X

Controlling		System		
		Direct expansion	Pump direct	Pump indirect
Room	Room activation	X	X	X
	Room T, cooling valve	X	X	X
	Modulaire inlet valve / electronic expansion valve	X	X	X
	Secundairy circulation pump			X
	Coolant supply temperature (3-way)			X
	Defrost (hotgas valve, electric element)	X	X	X
	Defrost drain heating	X	X	X
	Evaporation pressure	X	X	
	Sunction valve	X	X	
	Evaporator Fan running	X	X	X
	Heating	X	X	X
	Dehumification (cooling + heating)	X	X	X
	Alarm T based (control, product)	X	X	X
	Alarm refrigerant leakage	X	X	X
	Alarm thermic	X	X	X
Refrigeration plant	Compressor capacity (step / frequency)	X	X	X
	Condensor capacity (step / frequency / EC)	X	X	X
	Pump capacity		X	X
	Hotgas / heat exchanger valve	X	X	X
	Oil / Head cooling	(X)	X	X
	Alarm T based (control, product)	X	X	X
	Alarm refrigerant leakage / level	X	X	X
	Alarm thermic	X	X	X

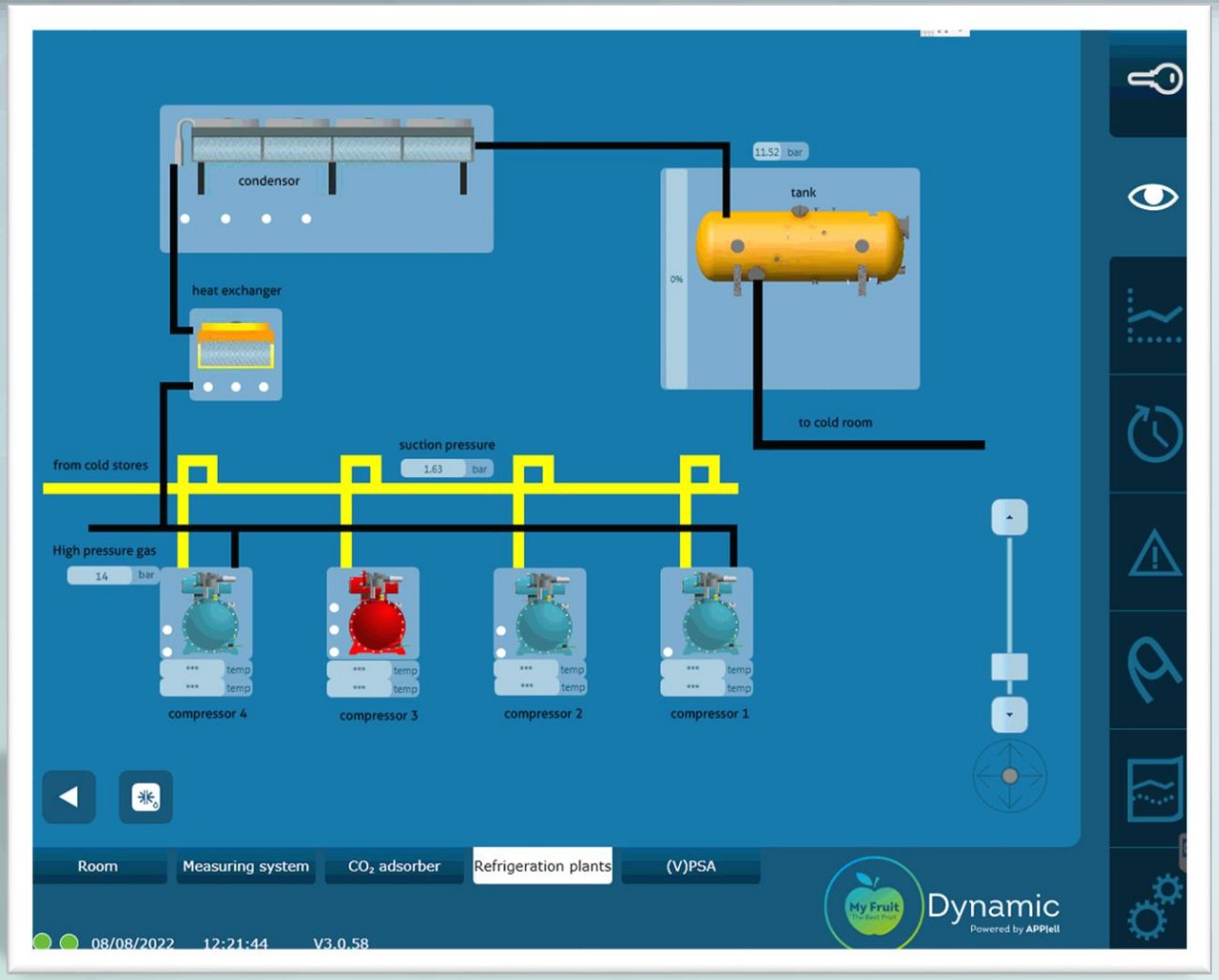
My Fruit Machine Room Control

Up to 6 refrigeration plants

- Compressors (frequency control)
- Condensers (frequency control or EC)
- Tanks for liquid refrigerant
- Pumps
- Compressor head cooling
- Heat exchanger for indirect cooling

Safety management

- Refrigerant level sensors
- Refrigerant Leakage detection sensors
- Input alarms (compressors, condensers, pumps)

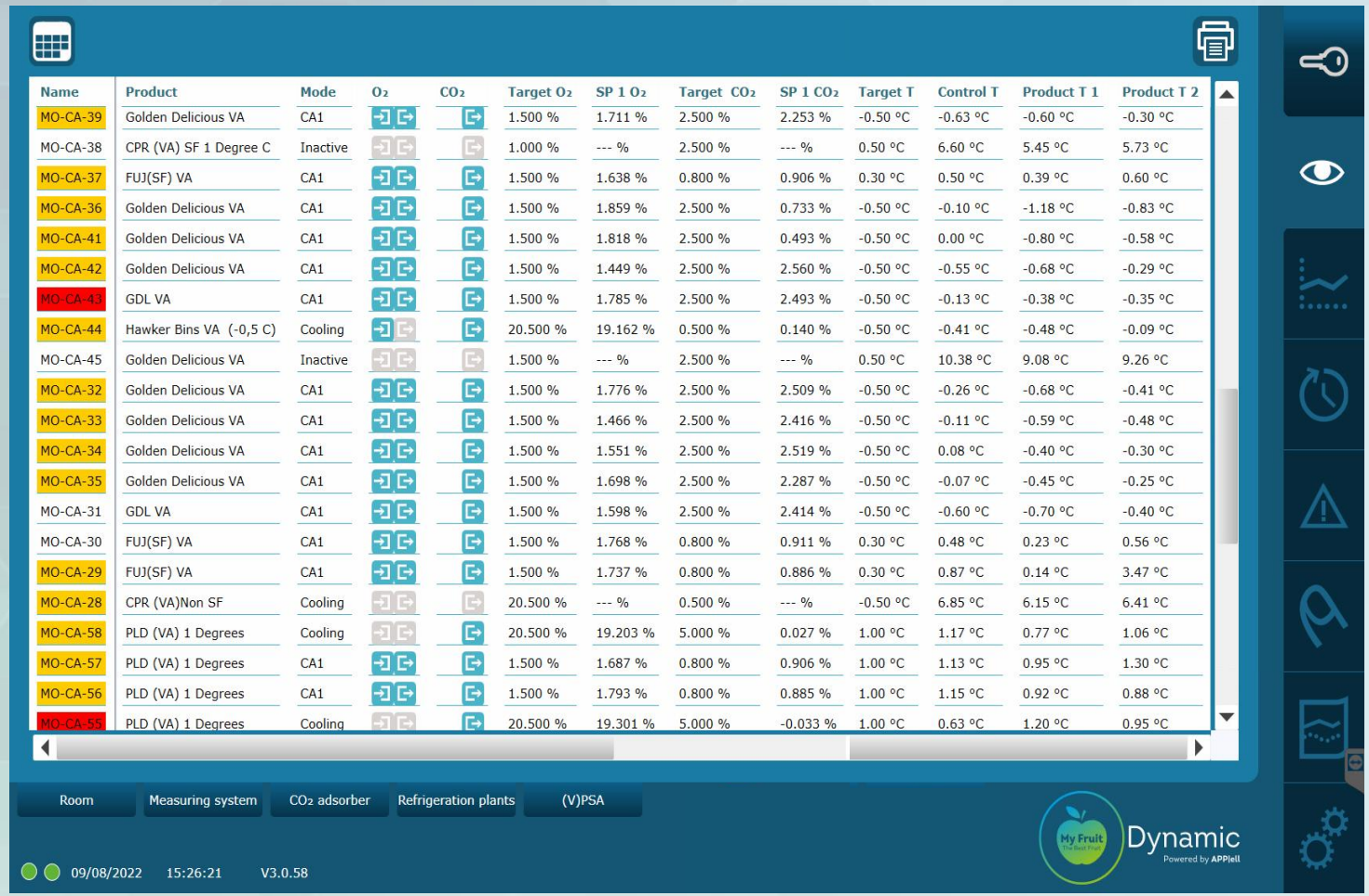


My Fruit Cooling & CA control

Benefits for Operation & Management

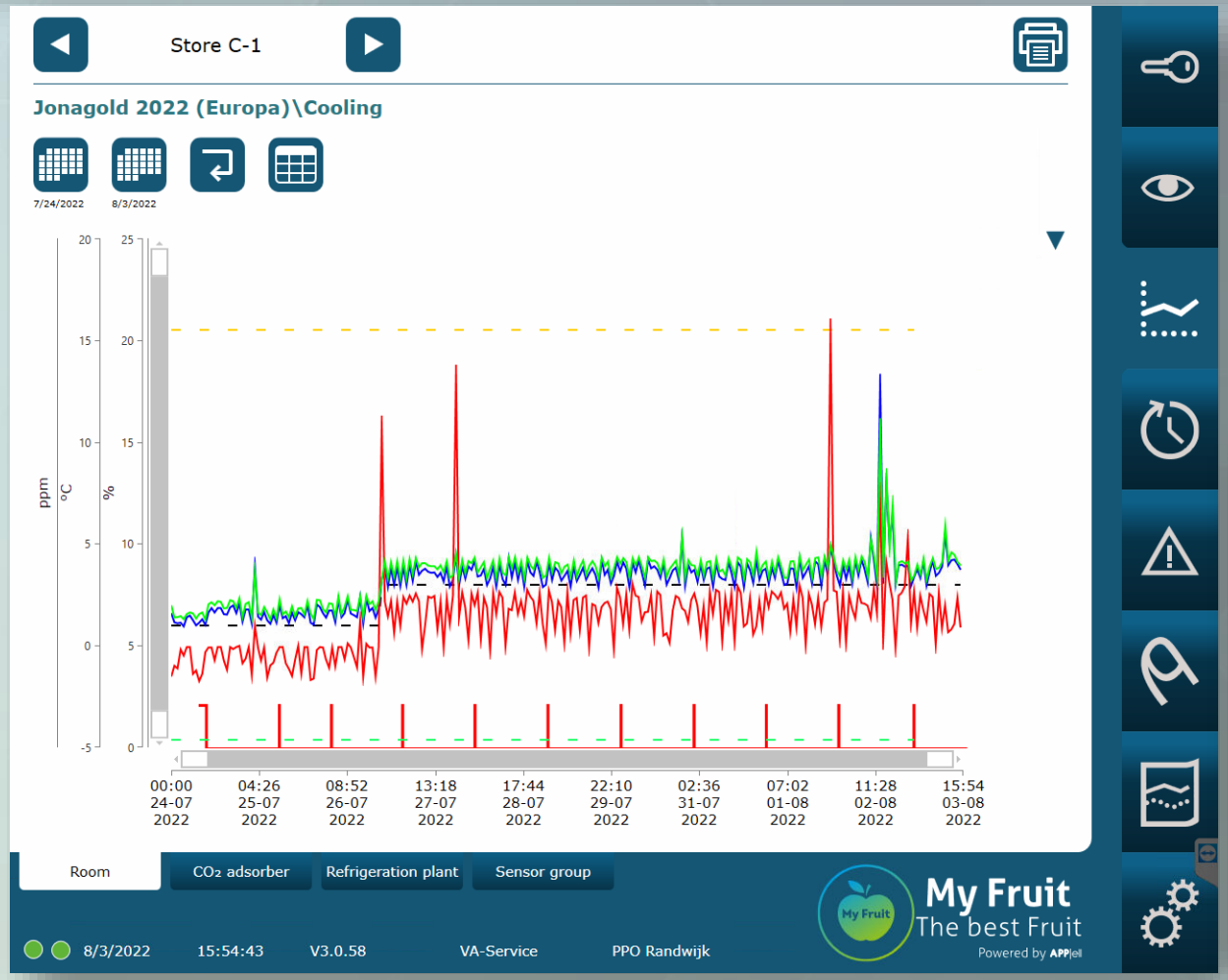
- All settings and monitoring in one system
- Product and Mode pre-settings
- Multiple functionalities:
  - Clear overview of cooling & CA data in ONE table or graph
  - Registration overviews
  - Alarm system for cooling & CA overviews
  - Number of actions & running hours for service & energy info

My Fruit makes it simple

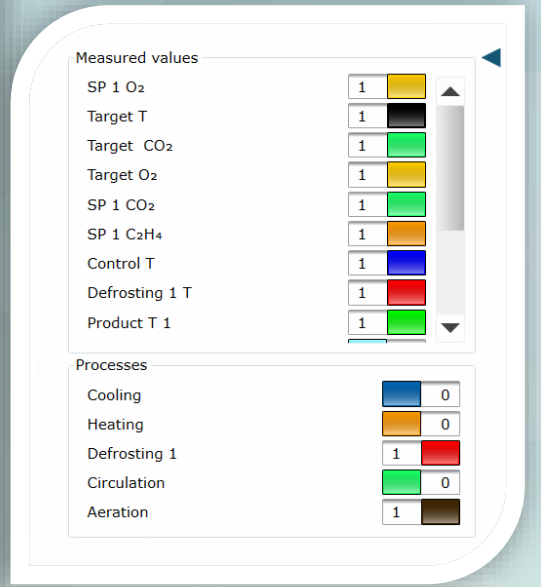


My Fruit Cooling & CA control

Benefits for your products



- All related parameters in one (customized) graph
  - CA conditions values
  - Temperature & RH values
  - Product status indicator
  - CA & cooling process indicator
- Easy to track & trace the deviations and malfunctioning
- Historical data gives information for future storage



My Fruit makes it simple

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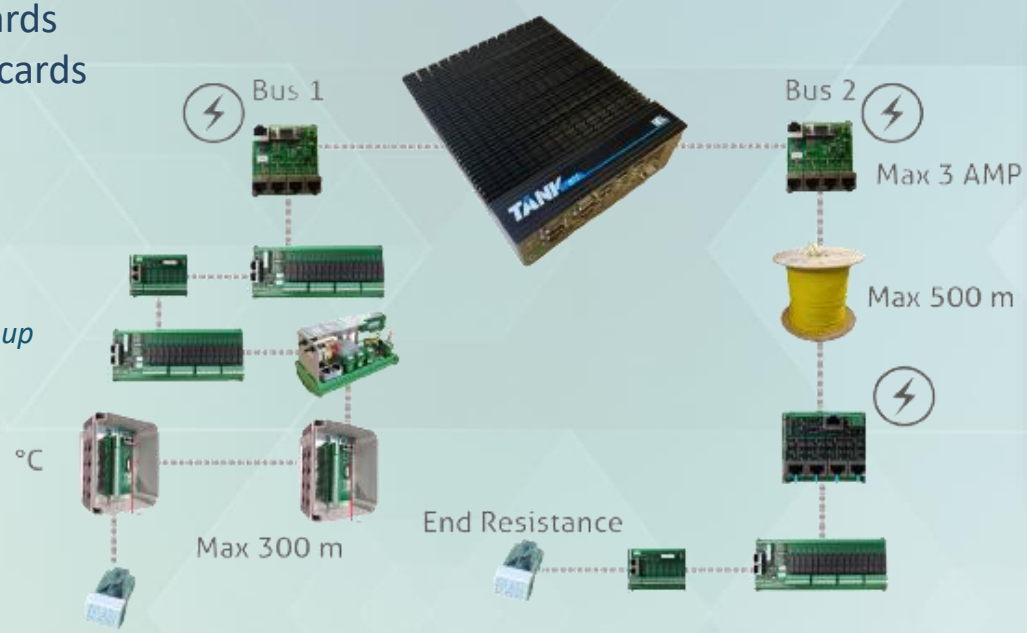
Benefits for Installation & Communication

- Cat6 cables
- Manual forcing of relay outputs via a print switch
- Plug & play
- Easy to extend
  - Relay cards
  - Digital input cards
  - Analogue entry cards
  - Analogue output cards
  - PT100 and PT1000 cards

My Fruit can customize your CA & cooling installation via flexible configuration of In/Outputs



Example of installation set up

Cooling panel

Main panel

These Options Make Big Differences!

Pressure sensor per room:
- Pressure control during cooling
- Pressure control for leakage testing
- Pressure control during ACR respiration measurement

Water meter per room:
- Water loss indicates the functioning of cooling system
- Water loss gives info on fruit quality

Independent temperature pilot sensor per room:
- To prevent too low temperature

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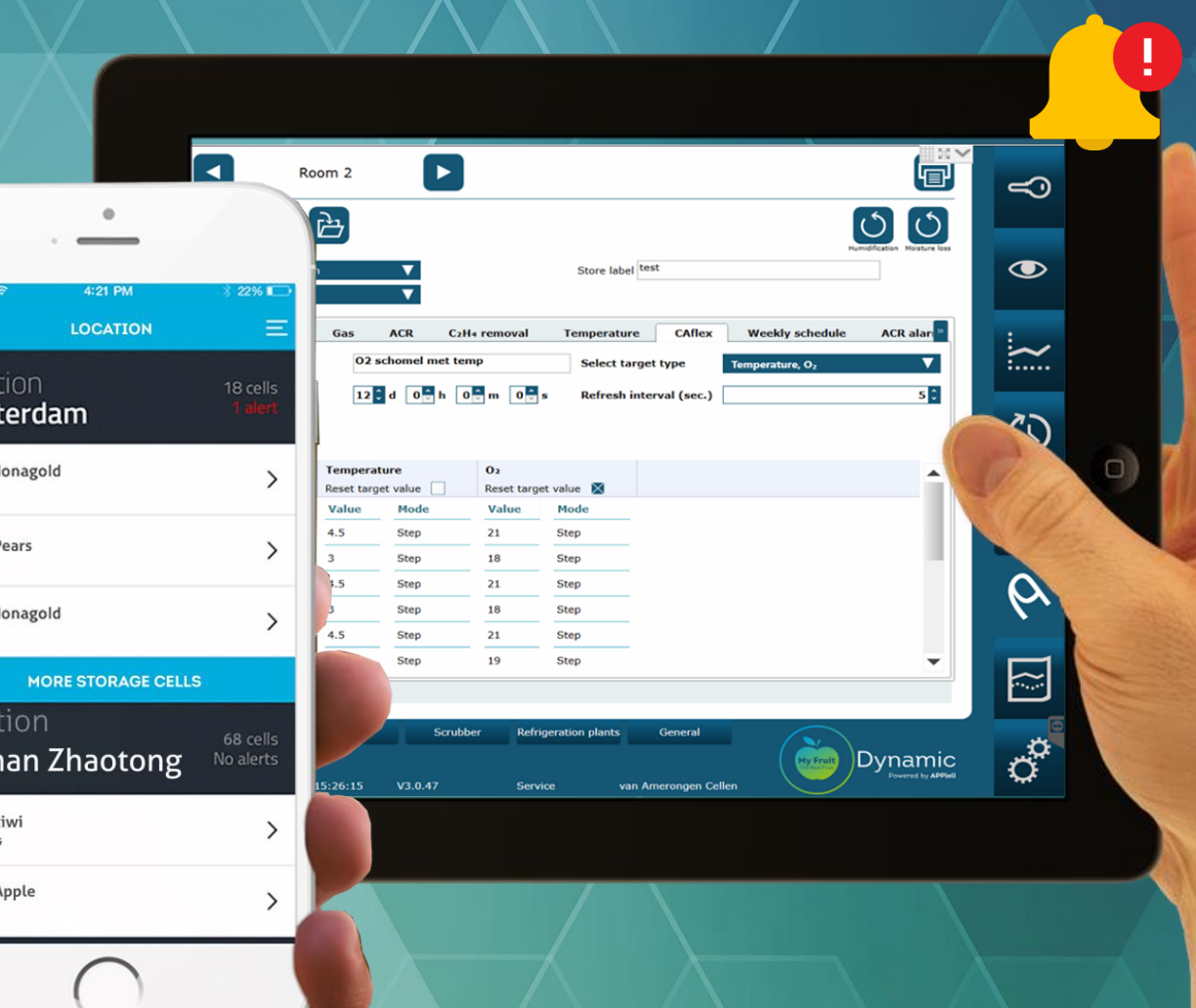
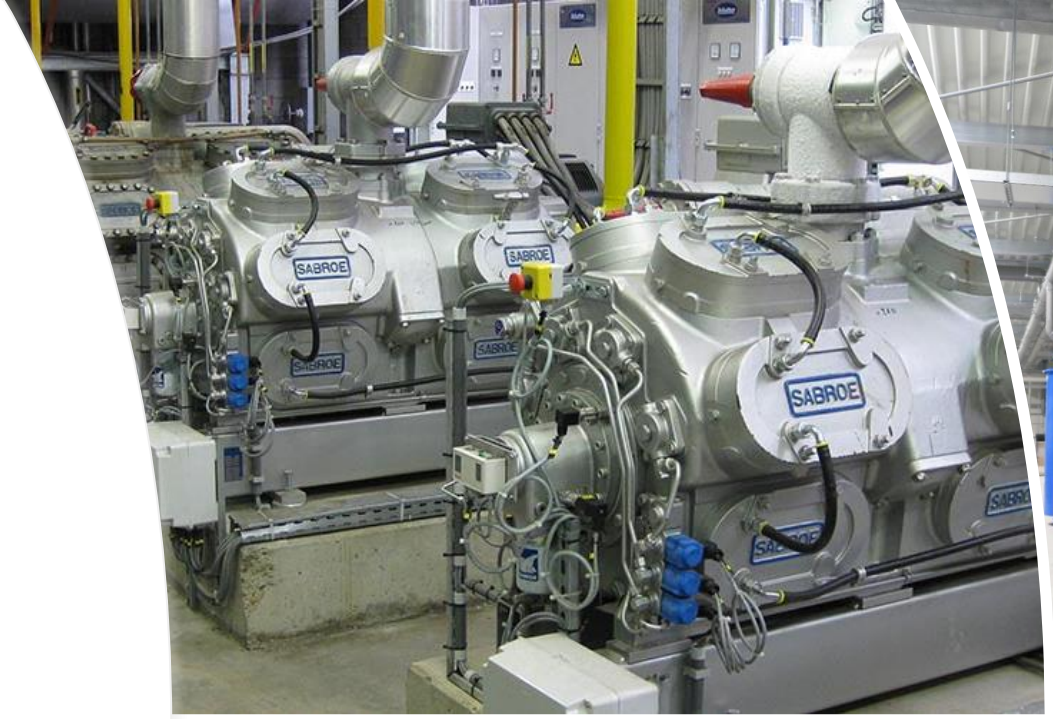
Worldwide monitoring and control
Data is safe in the Cloud



References in over 60 countries



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Van Amerongen CA Technology B.V.

Biezenwei 6 | 4004 MB Tiel

info@van-amerongen.com

+31 (0)344-670 570

van-amerongen.com