TROX® AITCS
Advanced IT Cooling Systems

CO_2OLrac™

- 30kW cooling capacity
- Optional dual coil ‘N+N’
- Dual ‘A+B’ power supply
- LED indicator + BMS interface:
  - Fan failure
  - CO_2 isolation
- Leak detection & automatic CO_2 isolation
- Off coil temperature monitoring + BMS interface

Next developments:

- 40kW+ cooling capacity

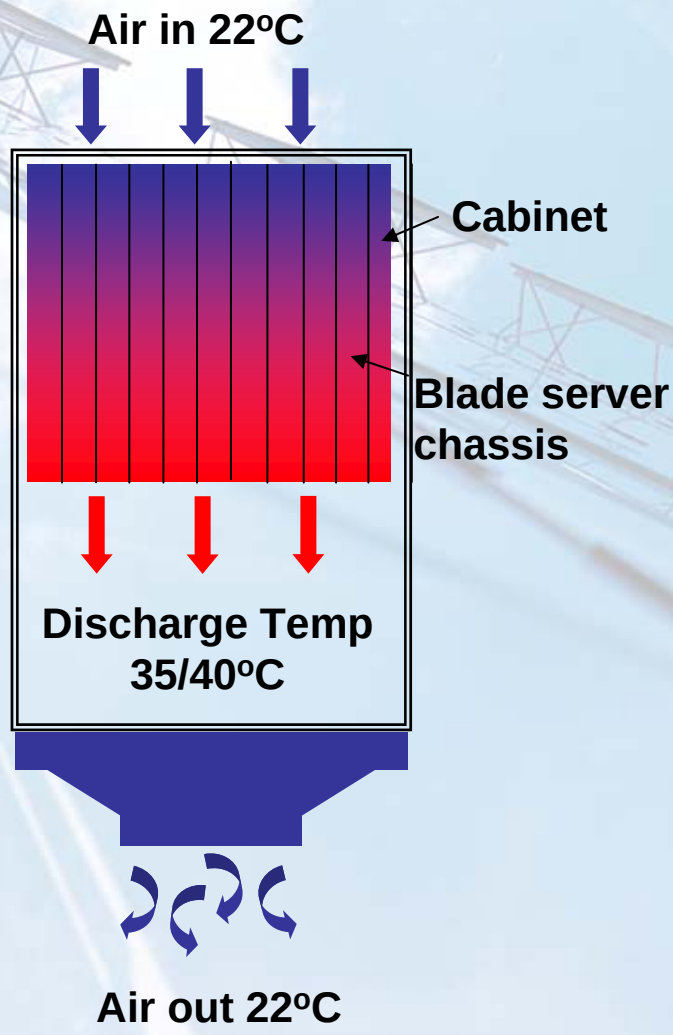
CO_2OLrac ™ – G4

47U x 800mm rack

CO_2OLrac™ - CABINET COOLING

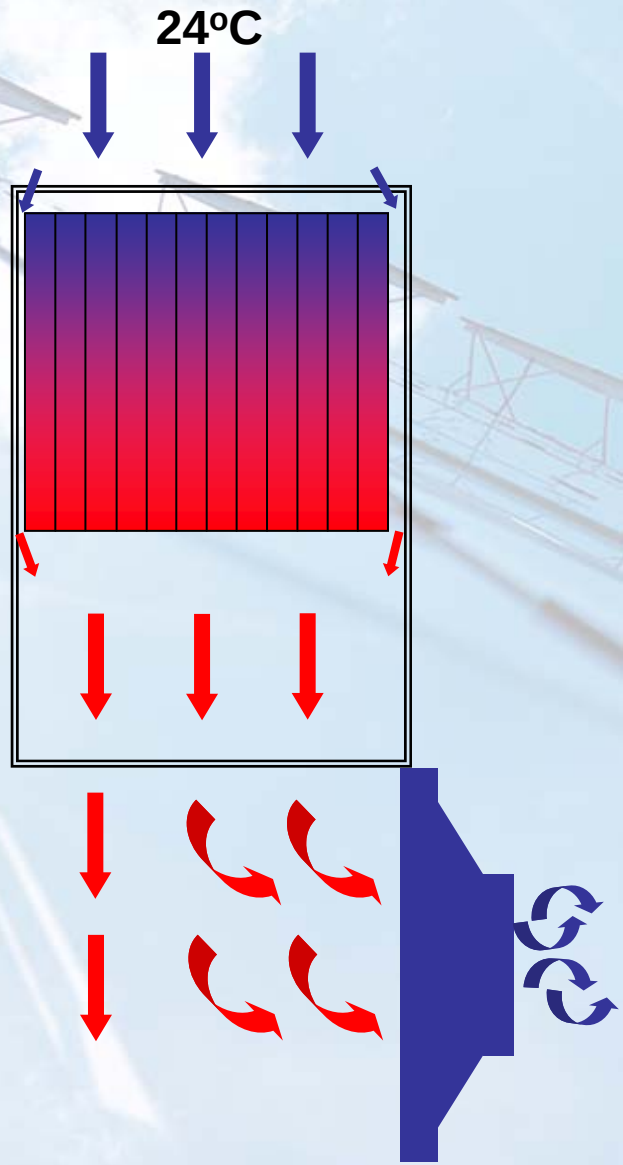
Design basis:

- Absorbs heat
  - Does not provide cooling
  - CO_2 at 14ºC, 49Bar(A)
  - Above dew point
- Air drawn into cabinets by ‘blade’ fans
- Heat absorbed via CO_2 heat exchanger
- Off cabinet air temperature is ‘room neutral’

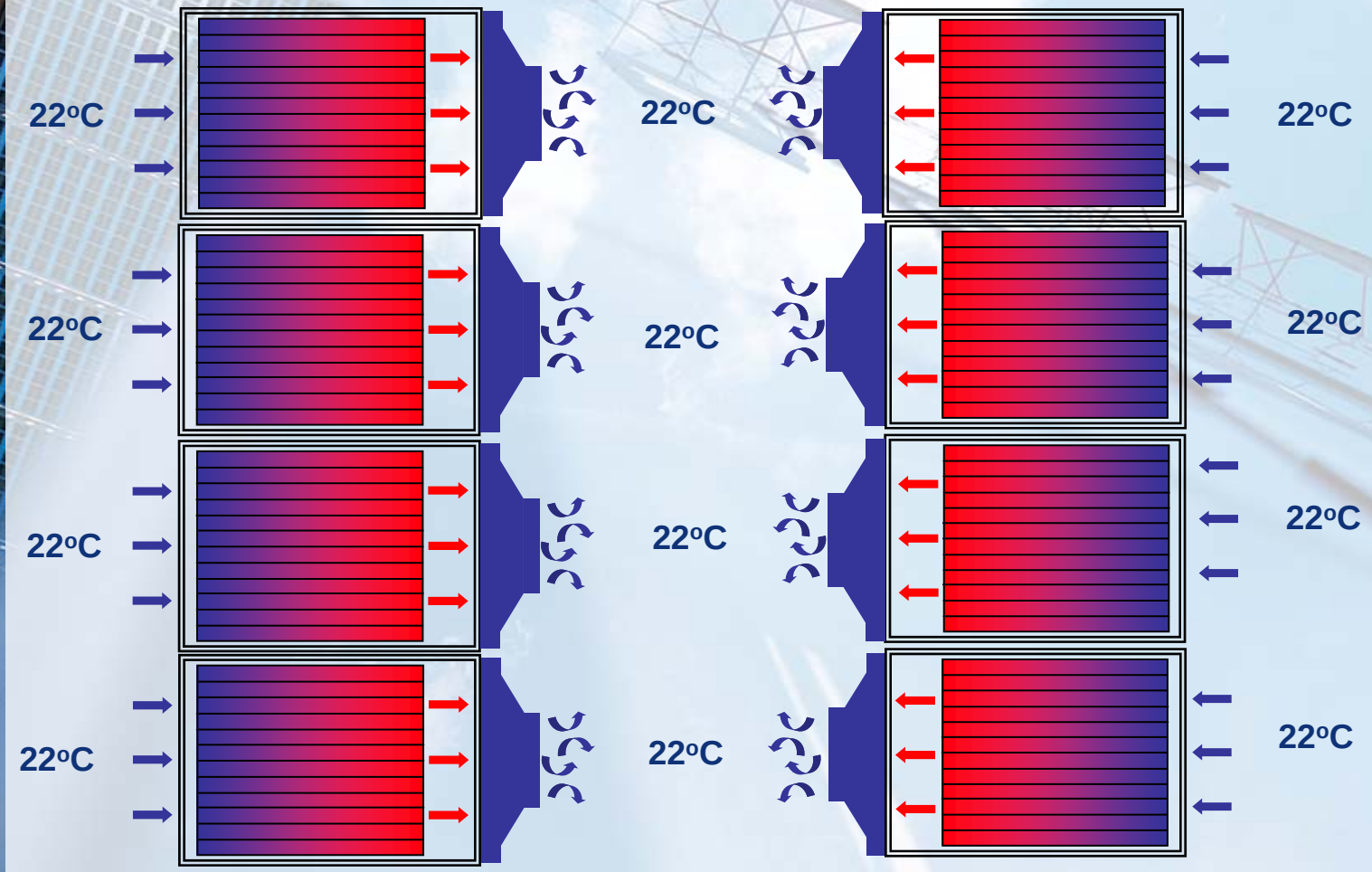


CO_2OLrac™ - CABINET ACCESS

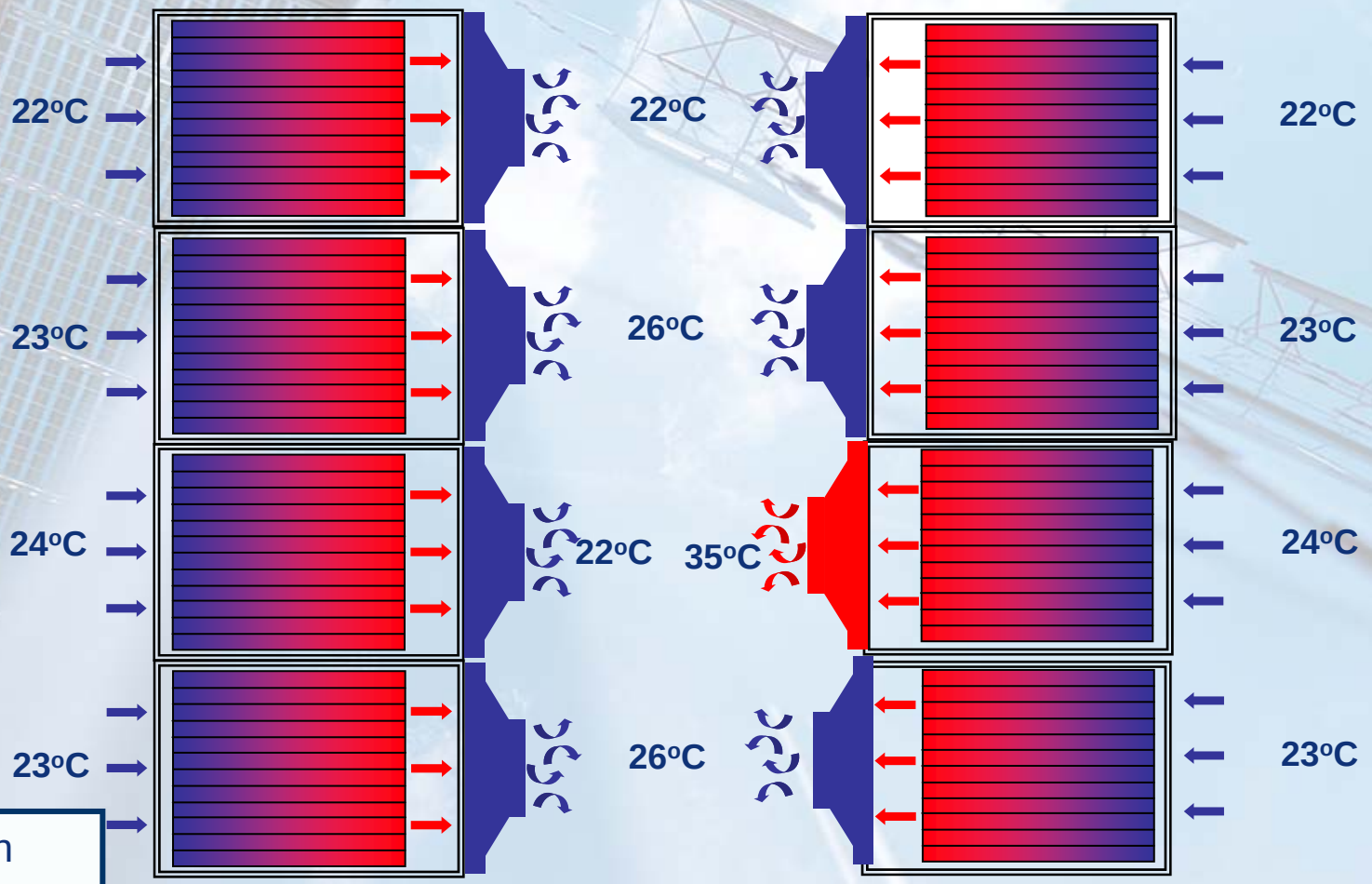
- Access via rear hinged door
- Blade load discharged
  - 60/70% into CO_2OLrac:load absorbed
  - 30/40% into aisle
- Local ambient temperature + 2°C
- Increased temperature differential
- Self compensating system



INTRINSIC RESILIENCE : SITUATION NORMAL



INTRINSIC RESILIENCE : FAILED CO_2



- Heat absorption
- 50% CO_2 overfeed
- Open Architecture

CO_2 GAS DETECTION

Beacon and Sounders

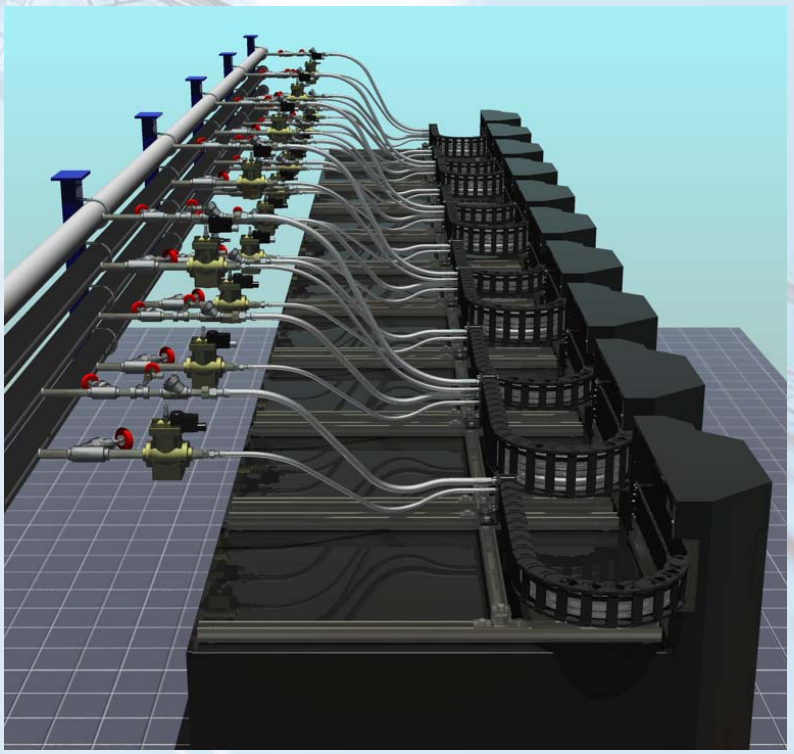
Gas Detection Panel

Gas Detection Chamber

Room sensor

PIPEWORK & CONNECTIONS

N + N power & cooling connections



N + N distribution system

WHY CARBON DIOXIDE?

- High capacity cooling
- CO_2 is electrically benign
- Smaller pipework & coils

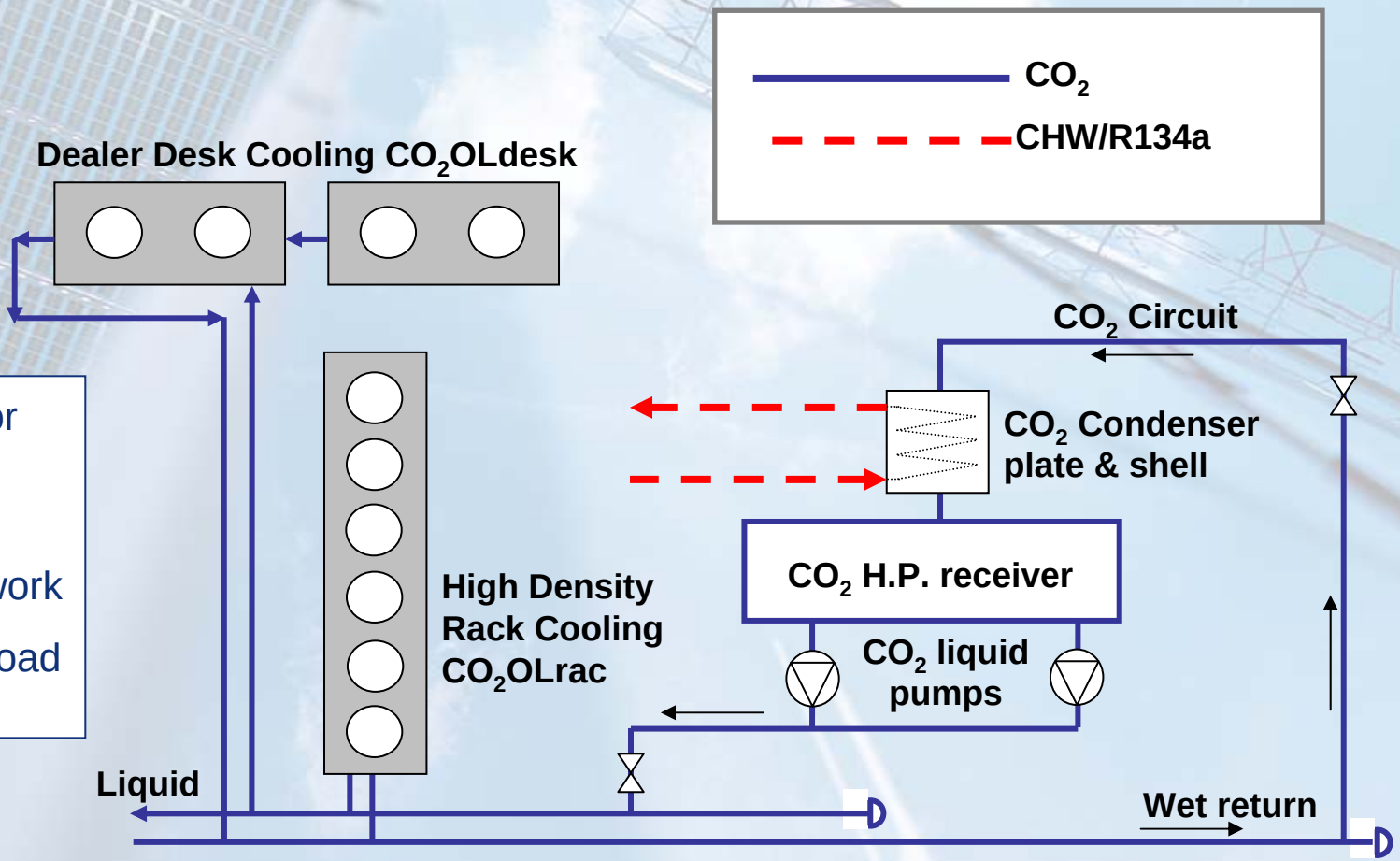
The latent heat capacity Carbon Dioxide is 182kJ/kg compared to the specific heat capacity of H_2O = 4.2kJ/kgK, which means that:

- 1kg CO_2 absorbs 182kJ of energy in its 'phase change'
- 1kg of H_2O absorbs 4.2kJ of energy for 1°C temperature rise:
  - CHW flow/return 6/12°C 1kg H_2O absorbs 25.2kJ
- Therefore 1kg of CO_2 absorbs 7 times more energy than water:
  - 182kJ / 25.2kJ = 7.22

- Reduced pumping power
- Reduced CO_2 footprint
- Recycled CO_2

CO_2OLrac™ SCHEMATIC – SECONDARY VOLATILE CO_2

- Primary CHW or Refrigerant
- Valve free distribution pipework
- Self balancing load driven



N + N : CO_2OLairpac™, PIPEWORK & COILS