

Course content 4 days Engineers

Theoretical and practical (preliminary)

Introduction till CO₂

- Why CO₂?
- Refrigerants environmental impact
- Basic refrigeration techniques
- CO₂-based system solutions
- Energy efficiency

- Theoretical cases and exercises

System components

- Common unit design
- Valves
- Compressors
- Heat exchanger

Safety

- Handling of gas bottles
- Safety valves
- Gas detectors
- Personal safety
- Safety equipment

PED & Material

- PED - Pressure Equipment Directive
- Pressure test
- Material in system solutions
- Seals, hoses etc.
- Pipe materials and soldering technology

Heat recovery solutions

- Different types of heat recovery systems
- Heat recovery control
- Temperature levels 1-2-3
- Included material
- System optimization

CO₂ applications

- Small systems
- Heat pumps
- Industrial and retail

Refrigeration units and systems

- Single units
- Booster units
- 3-temperature units
- Condensing units
- Ejector systems

Case studies – system design and calculation exercises

- Refrigeration unit design
- Heat exchanger, theoretical and practical design
- Component design tools
- Pipe dimensioning
- System comparisons and simulation tools
- Application examples



Software and tools

- CoolPack
- Compressor selection tools
- Pack calculation II
- Simple one-stage
- Refprop

Theoretical review of practical moments with CO2 as refrigerant

- Handling of gas containers, couplings, hoses, etc.
- Evacuation and filling of systems
- Safety aspects and safety equipment
- Pressure testing

Theoretical review of commissioning and adjustment of CO2 systems

- Refrigerator and freezer
- How the control system works and the benefits of using the full range of control system functions
- Commissioning protocol
- Checklists

The Pressure Equipment Directive and general rules for the use of CO2 as a refrigerant

- Introduction
- Equipment
- Exercises

Course conclusions and completion

- Q&A
- Discussion
- Final comments

Documentation for participants

- USB with all documentation included

Course Details

Duration

4 days

Location

Primary course location Stockholm, Sweden

Nearest Airport Stockholm Arlanda Airport

Course focus

Awareness of the role of the consultant/engineer as the linchpin between end users and contractors/suppliers of materials etc.

Motto

Learning by doing, learn things today – do things tomorrow, in your own professional situation.

Approach to the training

1. Explanation of the subject by the instructor.
2. Discussion and exchange of knowledge and experiences between participants and instructor.
3. Personal approach – present and wanted/desired.
4. The participants practice the new behavior.
5. Personal action plan for each practiced subject.

Size of training group

7-12 participants

co₂Academy