

# Advanced Industrial Refrigeration course

Join us for a 5-day training program dedicated to Advanced Industrial Refrigeration, brought to you by Danfoss in collaboration with The Technical College of Jutland. This intensive training experience combines theoretical learning with practical application to equip participants with a well-rounded knowledge of industrial refrigeration systems.

Upon successful completion of this course, attendees will gain:

1. In-depth insights into refrigeration plant theory and practical experience at the on-site ammonia plant.
2. A foundational understanding of Danfoss's industrial refrigeration portfolio.
3. Ten working stations will ensure practical experience.
4. Valuable hands-on experience with key refrigeration components.
5. Proficiency in configuring and starting up selected controllers and GD sensors and much more.
6. Signed certificate of completion with the program description.

## Part 1

You will be required to watch the service videos on selected Danfoss components, complete selected Danfoss eLessons and go through the station documents prior to Part 2 of this course.

## Part 2

A two-day course led by Danfoss experts, held at the Technical College of Jutland. It includes supervised self-study and hands-on training on selected products at 10 training demo stations.

## Part 3

A three-day course led by the Technical College of Jutland. It covers refrigerant plant theory and practical instruction at the on-site ammonia plant. This part also includes a safety course.

### Program

## Part 2. Danfoss Portfolio, incl. Hands-on\*

0. **Introduction to the Danfoss portfolio.** Overview of the Stations.
1. **ICLX**, Disassembling-assembling refer service video. Identification of parts according to drawing and identification of function (ICLX 50 size).
2. **ICS**, Disassembling-assembling refer service video, identification of parts.
3. **ICM**, Disassembling-assembling refer service video, identification of parts, ICAD assembly – disassembly on ICM, Encoder test.
4. **ICF**, Disassembling-assembling refer service video, and identify function (ICF25-6).
5. **SVL**, 2 houses, Modules (REG-SVA-CVH-X-SCA-X-FIA), Disassembling-assembling including identification of parts.
6. **AKS4100** (Coax), LLS4000, EKE347 (Demo kit), (ICM/ICAD). Power up the system AKS4100-EKE347-ICAD/ICM and fill in parameters. **AKS4100**, EKE 347, setup wizard. Factory reset.
7. **EKE400** Demo box, Set up configurations both via display and CoolConfig.
8. **IPS8** Demo box, Set up, check setup, refer to different purge points in a system.
9. **GD sensor/GD controller.** Identify the portfolio on samples given. Sensor: Put a sensor into operation, change alarm point, do a calibration.
10. **KDC** disassemble, identification of parts, sources of error, refer to possible applications, assembly.
11. **Optional station when timing fits to single participant: ICC**, disassemble and identify the difference to CHV-X, identify application together with ICD; **ORV**, disassemble, identification of parts and identification of function, identify element and movement, identify failure movement. **GD sensor**, Power up a Modbus system and connect via PC Tool to a PC – Supervised.

\*Please note that there may be slight adjustments to the course content.

## Part 3. Two-stage Ammonia Plant Practice\*

After completing this course, participants will:

1. Use ammonia as a refrigerant, describe its benefits.
2. Apply safety conditions while working on ammonia refrigeration systems.
3. Commission and operate a two-stage refrigeration plant with freezer room and flake ice machine applications.
4. Describe how the ammonia plant operates.
5. Explain the advantages of the two-stage refrigerant cycle.
6. Understand log p-h diagram and refrigeration cycle process.
7. Explain the main components needed in a two-stage plant, including design and construction of the surge drum, intermediate cooler, cooling tower, condenser, receiver and cooling applications.
8. Know how to set-up a hot gas defrost cycle (Hands-on experience at the ammonia test plant).
9. Understand gravity and pump circulation.
10. Use the procedure for handling air, water and dirt in ammonia refrigerating systems.
11. Experience oil drain and safe take out of the ammonia samples (e.g., IPS8 for Air)

\*Please note that there may be slight adjustments to the course content.



### Who is this relevant for?

Professionals, working in Sales and Technical Support; those who would like to learn more about ammonia industrial refrigeration system or to get a refresher course, including hands-on experience of Danfoss products.

### Do I need to do anything beforehand?

Yes, you will be required to watch the service videos, review the station documents and complete the selected Danfoss eLessons before coming to the training. Participants of the course should bring safety shoes, a computer, safety glasses, and dress in casual or relaxed clothing.

### How much does it cost?

2,150 EUR including accommodation and all meals.

### In which language will it be conducted?

The course will be conducted in English.