

CATALOG
2018

EXPORT

clauger 
FORMATION

**& INDUSTRIAL REFRIGERATION
& AIR TREATMENT**



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Training center

Registered under number 82 69 03975 69



Clauger is a training center specializing in industrial refrigeration and air treatment under prefecture number 82690397569.

With more than 45 years' experience in industrial refrigeration and air treatment, Clauger offers a catalog of specific training courses that meet the needs of industries, and their operators in particular.

It has been developed by experienced trainers, all of whom have worked in the field and have substantial experience in industrial refrigeration.

Clauger's offer meets the requirements of Training departments.

The range of proposed topics meets 3 criteria:

- **Adapting an employee to his new job,**
- **Developing or keeping an employee in his current job,**
- **Developing an employee's skills.**

Our sessions are structured around 4 skills levels:

- Ability to **design** an installation
- Ability to **run** an installation, whether or not it is subject to regulations
- Ability to **maintain** an installation
- Ability to **use** and optimize an installation

Our services qualify as continuing education.

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F-EX-01 TRAINING

INTRODUCTION TO A SIMPLE REFRIGERATING CIRCUIT - KNOWING YOUR REFRIGERATION INSTALLATION

AIM:

Teach maintenance personnel the operating principles of a refrigeration system so that they can control it and carry out basic maintenance tasks.

TARGET AUDIENCE

Maintenance and technical servicing personnel

NUMBER OF TRAINEES

1 to 6

PREREQUISITES

None

PROFILES

Beginners
Intermediate
Advanced

COURSE DURATION

2 seven-hour days of classroom instruction (8.30-12.00 and 14.00-17.30)

LOCATION

In your premises OR
at CLAUGER's 69 Brignais - France

COURSE DATES

To be defined

TRAINER

Technical expert

COURSE VALIDATION

End-of-course assessment of learning outcomes
Satisfaction questionnaire
Training certificate

COURSE MATERIAL AND RESOURCES

Customer's installation, customer's documentation (technical data sheets and plans) and specific documents

COURSE PRICES

Contractual for 2018

In your premises:

Guide price: €2,000 net excluding tax + course costs + the trainer's living and travel expenses payable by the customer.

At CLAUGER's:

Guide price: €2,000 net excluding tax + course costs

*Terms of sale:
see our general terms of sale*

PROGRAM

DAY 1

Basic physical concepts of a refrigerating circuit

Its components: Evaporators, condensers, expansion valves

Presentation of a simple refrigeration system

Presentation of the different types of compressor

DAY 2

Refrigerating regulation

Defrosting

Checking the good working order of a simple refrigeration system

Operating records

How does your system work? A practical study of your refrigeration system based on your machine room, the distribution part if necessary and documents, drawings and diagrams

Functional analysis of the equipment

Questions/Answers

F-EX-02 TRAINING

**MINOR DAILY MAINTENANCE (VISUAL)
Level-1 checks - Operating traceability**

AIMS:

Teach maintenance personnel the different parts of a refrigeration system in order to monitor it. In other words, put in place daily checks, with forms for recording parameters and management of an event log, these are level-1 maintenance checks.

PROGRAM

DAY 1

Presentation of the operation of a refrigeration system

Its components: Heat exchangers, evaporators, compressors, condensers, expansion valves

Discovery of your refrigeration systems from your machine rooms

Devising a daily readings sheet for your installations

Devising an event log for the traceability of your installations

DAY 2 - Putting into practice:

Based on your installation, trainees are required to identify the different devices, heat exchangers, evaporators, compressors, condensers and expansion valves.

Finding the various monitoring and measuring instruments: oil level and fluid levels, pressure gauges, thermometers, temperature and pressure indicators on the monitor for recoding readings of important daily measurements on your installations

Trainees do a simulation exercise corresponding to a typical day: Take a daily reading and record it on forms designed during the course.

Questions/Answers

TARGET AUDIENCE

Maintenance and technical servicing personnel

NUMBER OF TRAINEES

1 to 6

PREREQUISITES

None

PROFILES

Beginners
Intermediate
Advanced

COURSE DURATION

2 seven-hour days of classroom instruction (8.30-12.00 and 14.00-17.30)

LOCATION

In your premises OR
at CLAUGER's 69 Brignais - France

COURSE DATES

To be defined

TRAINER

Technical expert

COURSE VALIDATION

End-of-course assessment of learning outcomes (analysis of the values on the daily readings form and the event log).
Satisfaction questionnaire
Training certificate

COURSE MATERIAL AND RESOURCES

Customer's installation, customer's documentation (technical data sheets and plans) and specific documents

COURSE PRICES

Contractual for 2018

In your premises:

Guide price: €2,000 net excluding tax + course costs + the trainer's living and travel expenses payable by the customer.

At CLAUGER's:

Guide price: €2,000 net excluding tax + course costs

*Terms of sale:
see our general terms of sale*

ROUTINE MAINTENANCE OF THE REFRIGERATION SYSTEM (VISUAL AND BASIC PREVENTIVE)

AIMS:

Teach maintenance personnel the different parts of a compressed air plant in order to carry out the most common maintenance tasks (cleaning the filters, topping up the oil, etc.)

PROGRAM

DAY 1

Reminder of how a refrigeration system works

Its components: Heat exchangers, evaporators, compressors, condensers, expansion valves

Discovery of your refrigeration systems from your machine rooms

Inventory of routine maintenance tasks matching your installations: Oil return filter, oil drain, make-up oil, air bleeder, vacuum draft, dessicant cartridge, leak detection, etc.

Devising a routine maintenance schedule

DAY 2

Hands-on training

On the basis of your refrigeration system, identify the different parts: Heat exchangers, evaporators, compressors, condensers, expansion valves

Routine maintenance work according to your installation: Oil return filter, oil drain, make-up oil, air bleeder, vacuum draft, dessicant cartridge, leak detection, etc.

DAY 3

Trainees put theory into practice according to the installation and customers' technical documents

Trainee assessment: Analysis of the values on the daily readings form and the event log

Routine maintenance work on your installations

Questions/Answers

TARGET AUDIENCE

Maintenance and technical servicing personnel

NUMBER OF TRAINEES

1 to 6

PREREQUISITES

Have completed F-EX-02 (visual)
Or work experience in monitoring an installation

PROFILES

Intermediate or advanced

COURSE DURATION

3 seven-hour days of classroom instruction (8.30-12.00 and 14.00-17.30)

LOCATION

In your premises OR
at CLAUGER's 69 Brignais - France

COURSE DATES

To be defined

TRAINER

Technical expert

COURSE VALIDATION

End-of-course assessment of learning outcomes
Satisfaction questionnaire
Training certificate

COURSE MATERIAL AND RESOURCES

Customer's installation, customer's documentation (technical data sheets and plans) and specific documents

COURSE PRICES

Contractual for 2018

In your premises:

Guide price: €3,000 net excluding tax + course costs + the trainer's living and travel expenses payable by the customer.

At CLAUGER's:

Guide price: €3,000 net excluding tax + course costs

Terms of sale:
see general terms of sale.

CORRECTIVE MAINTENANCE OF A REFRIGERATION SYSTEM (VISUAL AND CORRECTIVE)

AIMS:

Enable maintenance personnel having basic understanding of refrigeration systems to perfect their knowledge in order to control their installations and carry out corrective maintenance work:

prevent and locate faults, devise a maintenance schedule, assess wear parts that can cause faults and draw up a list of spare parts.

TARGET AUDIENCE

Maintenance personnel

NUMBER OF TRAINEES

1 to 6

PREREQUISITES

Have completed F-EX-03 (visual and preventive) or have professional exp. in maintenance

PROFILES

Intermediate or advanced

COURSE DURATION

3 seven-hour days of classroom instruction (8.30-12.00 and 14.00-17.30)

LOCATION

In your premises OR
at CLAUGER's 69 Brignais - France

COURSE DATES

To be defined

TRAINER

Technical expert

COURSE VALIDATION

Analysis of a fault on your chosen installations
End-of-course assessment of learning outcomes (analysis of the values on the daily readings form and the event log).
Satisfaction questionnaire
Training certificate

COURSE MATERIAL AND RESOURCES

Customer's installation, customer's documentation (technical data sheets and plans) and specific documents

COURSE PRICES

Contractual for 2018

In your premises:

Guide price: €3,000 net excluding tax + course costs + the trainer's living and travel expenses payable by the customer.

At CLAUGER's:

Guide price: €3,000 net excluding tax + course costs

Terms of sale:

see general terms of sale.

PROGRAM

DAY 1

Reminder of the key principles, basic physical concepts of the refrigerating circuit of your refrigeration systems: Evaporation, Condensation, Compression, Expansion

Regulation principles: glycol water and iced water temperature, low pressure, high pressure condenser

Devising a maintenance schedule

Analysis of wear parts that can cause faults

Preparing a list of emergency spare parts

DAY 2

Based on your refrigeration system, trainees put theory into practice

Fault location: low pressure, high pressure...

Taking readings on your refrigeration systems to analyse drifts that could lead to a failure

According to your installations: Load make-up, glycol water make-up and air bleeding

DAY 3

Trainees put theory into practice according to the installation and customers' technical documents

Questions/Answers

F-EX-05 TRAINING

AFTER-SALES AND ROUTINE AND CORRECTIVE MAINTENANCE OF THE REFRIGERATION SYSTEM (VISUAL, PREVENTIVE AND CORRECTIVE)

AIMS:

Teach maintenance personnel:

- *the workings of a refrigeration system so that they can carry out the most common maintenance tasks (cleaning the filter, oil make-up)*
- *to run their installations*
- *to carry out corrective maintenance tasks: prevent and locate faults, devise a maintenance schedule, assess wear parts that can cause faults and draw up a list of spare parts*

TARGET AUDIENCE

Maintenance personnel

NUMBER OF TRAINEES

1 to 6

PREREQUISITES

Have completed F-EX-03 (visual and preventive) or have professional exp. in maintenance

PROFILES

Intermediate or advanced

COURSE DURATION

4 seven-hour days of classroom instruction (8.30-12.00 and 14.00-17.30)

LOCATION

In your premises OR at CLAUGER's 69 Brignais - France

COURSE DATES

To be defined

TRAINER

Technical expert

COURSE VALIDATION

End-of-course assessment of learning outcomes (analysis of the values on the daily readings form and the event log)
Satisfaction questionnaire
Training certificate

COURSE MATERIAL AND RESOURCES

Customer's installation, customer's documentation (technical data sheets and plans) and specific documents

COURSE PRICES

Contractual for 2018

In your premises:

Guide price: €4,000 net excluding tax + course costs + the trainer's living and travel expenses payable by the customer.

At CLAUGER's: €4,000 net excluding tax + course costs

*Terms of sale:
see general terms of sale.*

PROGRAM

DAY 1

Reminder of how a refrigeration system works
Its components: Heat exchangers, evaporators, compressors, condensers, expansion valves
Discovery of your refrigeration systems from your machine rooms
Inventory of routine maintenance tasks matching your installations
Devising a routine maintenance schedule

DAY 2

Regulation principles: temperature of glycol water and iced water, condenser
Devising a routine maintenance schedule
Analysis of wear parts that can cause faults
Preparing a list of spare parts

DAY 3

Hands-on training
Identifying different devices: heat exchangers, evaporators, compressors, condensers, expansion valves
Routine maintenance work according to your installation: Oil return filter, oil drain, make-up oil, air bleeder, vacuum draft, dessicant cartridge, leak detection, etc.

DAY 4

Trainees put theory into practice according to the installation and customers' technical documents
Fault location: low pressure, high pressure...
Taking readings on your refrigeration systems to analyse drifts that could lead to a failure
According to your installations: load make-up, glycol water make-up and air bleeding

Questions/Answers

LEGIONELLOSIS SAFETY - EFFECTS AND PROTECTIVE MEASURES (COMPULSORY COURSE)

AIMS:

Teach personnel to recognize the effects of legionellosis and the measures to take to protect oneself.

Anticipate the risk of pollution, improve the quality and management of installations using water.

Compulsory course according to French regulations governing facilities classified for the protection of the environment*

TARGET AUDIENCE

Maintenance personnel

NUMBER OF TRAINEES

1 to 6

PROFILES

Beginners
Intermediate
Advanced

PREREQUISITES

None

COURSE DURATION

1 seven-hour day of classroom instruction
(8.30-12.00 and 14.00-17.30)

LOCATION

In your premises OR
at CLAUGER's 69 Brignais - France

COURSE DATES

To be defined

TRAINER

Technical expert

COURSE VALIDATION

End-of-course assessment of learning outcomes
Satisfaction questionnaire
Training certificate

COURSE MATERIAL AND RESOURCES

Customer's installation, customer's documentation (technical data sheets and plans) and specific documents

COURSE PRICES

Contractual for 2018

In your premises:

Guide price: €1,000 net excluding tax + course costs + the trainer's living and travel expenses payable by the customer.

At CLAUGER's:

Guide price: €1,000 net excluding tax + course costs

Terms of sale:

see general terms of sale.

PROGRAM

Legionella

Legionellosis

The monitoring system

Protections

Development and proliferation

Regulations

Treatments

Questions/Answers

*Facilities classified for the protection of the environment RCR and evaporative condensers (according to French government order of 14/12/2013)

The course deals with the risks of dispersion and proliferation of Legionella, the related preventive, corrective and remedial measures (characteristics and strategy for using treatment products, and monitoring resources) and the regulatory requirements.

AMMONIA SAFETY RUNNING AND MONITORING INSTALLATIONS (COMPULSORY COURSE) AND EQUIPMENT UNDER PRESSURE

AIMS:

Train maintenance personnel on the risks and operations to carry out in the event of a leak of ammonia fluid on all installations subject to declaration and approval according to the government orders of 16 July 1997, 11 November 2009 and 1st July 2013 (valid in France).*

Also train personnel tasked with running equipment under pressure subject to commissioning declaration in order to be officially recognized as fit for running it by its operator and periodically confirmed in this function (according to article 5 of the government order of 20 November 2017).

TARGET AUDIENCE

Maintenance personnel

NUMBER OF TRAINEES

1 to 6

PREREQUISITES

Work experience in refrigeration or have completed F-EX-01

PROFILES

Beginners
Intermediate or advanced

COURSE DURATION

2 seven-hour days of classroom instruction (8.30-12.00 and 14.00-17.30)

LOCATION

In your premises OR
at CLAUGER's 69 Brignais - France

COURSE DATES

To be defined

FREQUENCY

As often as necessary

TRAINER

Technical expert

COURSE VALIDATION

End-of-course assessment of learning outcomes
Satisfaction questionnaire
Training certificate

COURSE MATERIAL AND RESOURCES

Customer's installation, customer's documentation (technical data sheets and plans) and specific documents

COURSE PRICES

Contractual for 2018

In your premises:

Guide price: €2,000 net excluding tax + course costs + the trainer's living and travel expenses payable by the customer.

At CLAUGER's:

Guide price: €2,000 net excluding tax + course costs

Terms of sale:

see general terms of sale.

PROGRAM

THEORY ON:

- Ammonia fluid
- Ammonia tables and charts
- Effects on humans
- First aid in the event of an accident
- Extraction and detection organs
- Respiratory and bodily protective equipment
- Operations to carry out in the event of an ammonia leak
- Monitoring the installation's parameters
- Regulations governing ammonia fluid
- Monitoring equipment under pressure

PRACTICE

Simulated application of running and supervisory instructions in the installation's nominal operating conditions
Periodic training in running refrigeration systems in situations of compromised safety, and in carrying out maintenance on them. The theme will be chosen from a list of several situations:

- Pressure drift
- Temperature drift
- Presence of ammonia
- Detection of a safety device (e.g. pH meter, ammonia detection unit, etc.)

Simulated application of safety instructions:

Handling protection equipment allocated to the establishment (for authorized personnel)

Making an installation safe

Exercises simulating a leak of ammonia and damage. The theme will be chosen from a list of about ten situations.

- Leak on a compression unit
- Leak on low pressure capacity
- Leak on high pressure capacity
- Simulated burst of a pipe in liquid phase
- Maintenance of the opening of a safety valve
- Maintenance of the locking of a working valve (e.g.: oil or noncondensable drain valve)
- Repairing a leak when loading or discharging
- Making an installation safe
- Valve station leak scenario in the roof space

Participative method: Concerning the handling of protective equipment allocated to the establishment for authorized personnel, please provide us with the equipment ready for use. If you have individual breathing apparatus, bring one full air tank at 50 bar per person.

AMMONIA SAFETY - RAISING THE PLANT PERSONNEL'S AWARENESS ABOUT AMMONIA HAZARDS AND RISKS (COMPULSORY COURSE*)

AIMS:

Raise personnel awareness about the risks and hazards of ammonia, about evacuation instructions in the event of a leak of NH_3 (For information based on French regulations according to article L4121-1* of the Labour Code).

PROGRAM

Effects and properties

Effects on humans

First aid

Collective protection equipment

Chemical and respiratory protection

Detection

Signalling means

Supervision

Evacuation

Assembly points

Questions/Answers

* For information, French regulations (Article L4121-1 of the Labour Code)
The employer takes the necessary measures to ensure the safety and protect the physical and mental health of workers

These measures include:

1. Occupational hazard prevention measures
2. Information and training measures;
3. Putting in place a suitable organization and resources

The employer must adapt these measures to changing circumstances and seek to improve existing situations.

TARGET AUDIENCE

Production personnel. Personnel not assigned to ammonia installations but passing nearby. Operating personnel. Security personnel. Personnel passing or working in an unbreathable atmosphere, in the machine room and/or roof space

NUMBER OF TRAINEES

1 to 6

PREREQUISITES

None

PROFILES

Beginners
Intermediate or Advanced

FREQUENCY

As often as necessary

COURSE DURATION

half-day, 3½ hours (8.30-12.00) of classroom instruction

LOCATION

In your premises

COURSE DATES

To be defined

TRAINER

Technical expert

VALIDATION OF ACQUIRED KNOWLEDGE

End-of-course assessment of learning outcomes
Satisfaction questionnaire
Training certificate

COURSE MATERIAL AND RESOURCES

Customer's installation, customer's documentation (technical data sheets and plans) and specific documents

COURSE PRICES

Contractual for 2018

In your premises:

Guide price: €700 net excluding tax + course costs + the trainer's living and travel expenses payable by the customer.

At CLAUGER's: Please enquire or refer to the in-house training brochure

Terms of sale:
see general terms of sale.

SAFETY AND CONTROL OF INSTALLATIONS RUNNING WITH CO₂ (COMPULSORY COURSE*)

AIMS:

Acquire the necessary theoretical skills to run industrial refrigeration systems running on carbon dioxide (CO₂), know how to protect oneself and use appropriate respiratory protective equipment according to article L4121-1* of the French Labour Code.

TARGET AUDIENCE

Maintenance personnel

NUMBER OF TRAINEES

1 to 6

PREREQUISITES

None

PROFILES

Beginners
Intermediate
Advanced

COURSE DURATION

1 seven-hour day of classroom instruction (8.30-12.00 and 14.00-17.30)

LOCATION

In your premises or at CLAUGER's 69 Brignais - France

COURSE DATES

To be defined

TRAINER

Technical expert

COURSE VALIDATION

End-of-course assessment of learning outcomes
Satisfaction questionnaire
Training certificate

COURSE MATERIAL AND RESOURCES

(see participative method **)

COURSE PRICES

Contractual for 2018

In your premises:

Guide price: €1,000 net excluding tax + course costs + the trainer's living and travel expenses payable by the customer.

At CLAUGER's:

Guide price: 1 000 net excluding tax + course costs

Terms of sale:
see general terms of sale.

PROGRAM

History of CO₂ physical properties, the principle of installations

Constraints

Effects on humans

Respiratory protection

Detection

Interventions:

- Filter on valve station
- CO₂ pump filters
- Load and load make-up

Presentation of accidents

Safety during maintenance work

Questions/Answers

***Article L4121-1 of the Labour Code**

The employer takes the necessary measures to ensure the safety and protect the physical and mental health of workers.

These measures include:

1. Occupational hazard prevention measures,
2. Information and training measures,
3. Putting in place a suitable organization and resources.

The employer must adapt these measures to changing circumstances and seek to improve existing situations.

****Participative method:** Concerning the handling of protective equipment allocated to the establishment, the customer shall supply its equipment ready for use in good working order: Self-contained breathing apparatus, bring one full air tank at 50 bar per person.

MECHANICAL OVERHAUL - RECIPROCATING COMPRESSORS

AIMS:

Teach maintenance personnel how a piston compressor and its accessories work in order to carry out maintenance on it and resolve a fault or a malfunction.

TARGET AUDIENCE

Maintenance personnel

NUMBER OF TRAINEES

1 to 6

PREREQUISITES

None

PROFILES

Beginners
Intermediate
Advanced

COURSE DURATION

3 seven-hour days of classroom instruction (8.30-12.00 and 14.00-17.30)

LOCATION

In your premises OR
At CLAUGER's - 69 Brignais - France

COURSE DATES

To be defined

TRAINER

Technical expert

COURSE VALIDATION

End-of-course assessment of learning outcomes
Satisfaction questionnaire
Training certificate

COURSE MATERIAL AND RESOURCES

Customer's installation, customer's documentation (technical data sheets and plans) and specific documents

COURSE PRICES

Contractual for 2018

In your premises:

Guide price: €3,000 net excluding tax + course costs + the trainer's living and travel expenses payable by the customer.

At CLAUGER's:

Guide price: €3,000 net excluding tax + course costs

*Terms of sale:
see general terms of sale.*

PROGRAM

DAY 1

- Piston compressors
- The components and their roles
- Power regulation

DAY 2 and DAY 3

Based on the customer's installation

- Readings of operating conditions for initial diagnosis
- Stopping the compressor, electrical lockout
- Draining the compressor to work in complete safety
- Oil change
- Readings and analysis of running clearances
- Dismantling the compressor and tagging parts
- Analysing parts to diagnose an operational malfunction
- Selecting parts that need to be replaced or kept
- Replacing wear parts or damaged parts
- Reassembling the compressor
- Understanding why and how to make the compressor vacuum-tight
- Filling with oil
- Returning to service and checking operation
- Checking safety devices
- Filling in the repair form: parts replaced and readings of operating conditions for follow-up purposes
- Questions/Answers

MECHANICAL OVERHAUL - SCREW COMPRESSORS

AIMS:

Teach maintenance personnel how a screw compressor and its accessories work in order to carry out maintenance on it and resolve a fault or a malfunction.

TARGET AUDIENCE

Maintenance personnel, operators of classified facilities in respect of section 2921 (cooling installations that work by spraying water in an air flow)

NUMBER OF TRAINEES

1 to 6

PREREQUISITES

None

PROFILES

Beginners
Intermediate
Advanced

COURSE DURATION

3 seven-hour days of classroom instruction (8.30-12.00 and 14.00-17.30)
+ 1 seven-hour day (mechanical overhaul option)

LOCATION

In your premises OR
At CLAUGER's France 69 Brignais

COURSE DATES

To be defined

TRAINER

Technical expert

COURSE VALIDATION

End-of-course assessment of learning outcomes
Satisfaction questionnaire
Training certificate

COURSE MATERIAL AND RESOURCES

Customer's installation, customer's documentation (technical data sheets and plans) and specific documents

COURSE PRICES

Contractual for 2018

In your premises:

Guide price: €3,000 net excluding tax + course costs + the trainer's living and travel expenses payable by the customer.

Options: €1,000

At CLAUGER's:

Guide price: €3,000 net excluding tax + course costs

Options: €1,000

Terms of sale:
see general terms of sale.

PROGRAM

DAY 1

Screw compressors
The compressors and their roles
Power regulation

DAY 2 and DAY 3: Based on the customer's installation

Readings of operating conditions for initial diagnosis
Stopping the compressor, electrical lockout
Draining the compressor to work in complete safety
Oil change
Dismantling and replacing or cleaning the oil filter according to type
Understanding why and how to make the compressor vacuum-tight
Filling with oil
Returning to service and checking operation
Checking the oil cooling circuit
Checking safety devices
Checks, powering up and down
Questions/Answers

MECHANICAL OVERHAUL OPTION

DAY 4: Based on the customer's installation

Readings and analysis of running clearances
Dismantling the compressor and tagging parts
Analysing parts to diagnose an operational malfunction
Selecting parts that need to be replaced or kept
Replacing wear parts or damaged parts
Reassembling the compressor
Filling in the repair form: parts replaced and readings of operating conditions for follow-up purposes
Questions/Answers

ENERGY SAVINGS - MANAGING A REFRIGERATION SYSTEM

AIMS:

Optimize energy and management of refrigeration systems.

TARGET AUDIENCE

Project and new works manager, Maintenance or technical manager

NUMBER OF TRAINEES

1 to 6

PREREQUISITES

None

PROFILES

Beginners
Intermediate
Advanced

COURSE DURATION

1 eight-hour day of classroom instruction (8.30-12.00 and 14.00-18.00)

LOCATION

In your premises OR
at CLAUGER's 69 Brignais - France

COURSE DATES

To be defined

TRAINER

Technical expert

COURSE VALIDATION

End-of-course assessment of learning outcomes
Satisfaction questionnaire
Training certificate

COURSE MATERIAL AND RESOURCES

Technical training material
Customer's installation

COURSE PRICES

Contractual for 2018

In your premises:

Guide price: €1,200 net excluding tax + course costs + the trainer's living and travel expenses payable by the customer.

At CLAUGER's:

Guide price: €1,200 net excluding tax + course costs

*Terms of sale:
see general terms of sale.*

PROGRAM

Presentation of a thermodynamic cycle and a refrigerating machine

CoPs: coefficients of performance

How to optimize an installation?

Speed variation: compressors, pumps, fans, condensers

HP Floating

LP Floating, traveller card setpoint

Heat recovery: desuperheat, oil, condensation

Energy regulation of installations

Maintenance of installations

Fine-tuning, various adjustments

Energy efficiency certificate

Questions/Answers

AFTER-SALES AND AIR TREATMENT MAINTENANCE

AIMS:

Teach maintenance personnel the different parts of a compressed air plant in order to carry out the most common maintenance tasks

TARGET AUDIENCE

Maintenance personnel

NUMBER OF TRAINEES

1 to 6

PREREQUISITES

None

PROFILES

Beginners
Intermediate
Advanced

COURSE DURATION

2 seven-hour days of classroom instruction (8.30-12.00 and 14.00-17.30)

LOCATION

In your premises OR
At CLAUGER 69 Brignais - FRANCE

COURSE DATES

To be defined

TRAINER

Technical expert

COURSE VALIDATION

End-of-course assessment of learning outcomes
Satisfaction questionnaire
Training certificate

COURSE MATERIAL AND RESOURCES

Customer's installation, customer's documentation (technical data sheets and plans) and specific documents

COURSE PRICES

Contractual for 2018

In your premises:

Guide price: €2,000 net excluding tax + course costs + the trainer's living and travel expenses payable by the customer.

At CLAUGER's:

Guide price: €2,000 net excluding tax + course costs

Terms of sale:
see general terms of sale.

PROGRAM

DAY 1

How a compressed air plant works

Air flow, temperature concepts

Concept of filters compressed on air

Operation of equipment monitoring air flow, filter clogging and alarm: differential pressure switch, liquid column pressure gauge

Presentation of air treatment tool to check important parameters

DAY 2

Putting theory into practice

Readings of operating modes on air handling units

Air flow, water and air temperature readings

Filter clogging check: water and air filters, textile ducts

Parts to check: differential pressure switch, liquid column pressure gauge

Check: the cleanliness of the caisson, door seals

Check the ventilation: air flow, motor fastenings, turbine centring

Hydraulic check: watertightness of water circuits, verification of filters

Check regulation: verification of control valves, temperature and hygrometry sensors, flap registers, speed regulator

Measurement: difference in circulator pressure, pressure, temperature and hygrometry levels

Questions/Answers

F GAS - FUTURE REFRIGERANTS REGULATIONS

AIMS:

Have an overview of regulations and refrigerants of the future.

TARGET AUDIENCE

Project and new works managers, design offices, maintenance or technical manager

NUMBER OF TRAINEES

1 to 6

PREREQUISITES

None

PROFILES

Beginners
Intermediate
Advanced

FREQUENCY

As often as necessary

COURSE DURATION

1 seven-hour day of classroom instruction (8.30-12.00 and 14.00-17.30)

LOCATION

In your premises OR
at CLAUGER's 69 Brignais - France

COURSE DATES

To be defined

TRAINER

Technical expert/refrigeration engineer

COURSE VALIDATION

End-of-course assessment of learning outcomes
Satisfaction questionnaire
Training certificate

COURSE MATERIAL AND RESOURCES

Technical training material
Example application and lessons learned
Customer's installation

COURSE PRICES

Contractual for 2018

In your premises:

Guide price: €1,000 net excluding tax + the trainer's living and travel expenses payable by the customer.

At CLAUGER's: Please enquire or refer to the in-house training brochure

*Terms of sale:
see general terms of sale.*

PROGRAM

Current regulations

Refrigerants:

- Types, application, benefits and drawbacks
- Old, transitional, new fluids

Regulatory intelligence

Future fluid, how to make the right choice

- Natural: ammonia
- New fluids, big comeback of CO₂

Confinement

Alkali

RETROFIT R404A

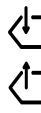

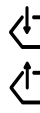

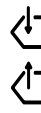
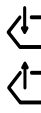

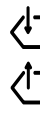
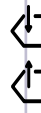

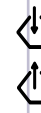



Questions/Answers



APPENDICES

SUMMARY TABLE OF COURSES PER PROFILE

	Beginner maintenance personnel	Intermediate maintenance personnel	Advanced maintenance personnel
F-EX-01 - Introduction - Simple refrigerating circuit - Knowing one's system	■	■	■
F-EX-02 - Minor daily maintenance (visual) - Level-1 checks - Operating traceability	■	■	■
F-EX-03 - Routine maintenance of a refrigeration system (elementary visual and preventive)		■	■
F-EX-04 - Corrective maintenance of a refrigeration system (visual and corrective)		■	■
F-EX-05 - After-Sales and routine and corrective maintenance (visual, preventive and corrective)		■	■
F-EX-06 - Legionellosis safety - effects and protective measures	■	■	■
F-EX-07 - Ammonia safety: Running and monitoring pressurized systems and equipment	■	■	■
F-EX-08 - Ammonia safety: Raising the plant personnel's awareness about ammonia hazards and risks	■	■	■
F-EX-09 - Safety and control of installations running with CO ₂	■	■	■
F-EX-10 - Mechanical overhaul of a piston compressor	■	■	■
F-EX-11 - Mechanical overhaul of a screw compressor	■	■	■
F-EX-12 - Energy savings - Managing a refrigeration system	■	■	■
TA-EX-13 - After-Sales and maintenance of an air treatment system	■	■	■
F-EX-14 - F-GAS - Regulations governing refrigerants of the future	■	■	■

TITLE	PROFILE	NUMBER OF TRAINEES	DURATION (days)	LOCATION	PREREQUISITES	TARGET AUDIENCE	GUIDE PRICE
F-EX-01 Page 4	Open to all	1 à 6	2 days		/	Maintenance and technical servicing personnel	2 000 € net excl. tax
F-EX-02 Page 5			2 days				2 000 € net excl. tax
F-EX-03 Page 8	Intern. Advanced		3 days		Have completed F-EX-02 or have prof. exp. in monitoring an installation	Maintenance personnel	3 000 € net excl. tax
F-EX-04 Page 9			3 days		Have completed F-EX-03 or have professional exp. in maintenance		3 000 € net excl. tax
F-EX-05 Page 10			4 days		/	Maintenance personnel	4 000 € net excl. tax
F-EX-06 Page 11			1 days				1 000 € net excl. tax
F-EX-07 Page 12	Open to all		2 days		Have professional exp. in refrigeration or have completed F-EX-01	Prod. personnel, pers. not assigned to ammonia instal. but passing nearby, operating pers., security personnel, passing or working in an unbreathable atmosphere, in a machine room and/or in tech. attic space.	2 000 € net excl. tax
F-EX-08 Page 13			0.5 days		700 € net excl. tax		
F-EX-09 Page 14	Open to all		1 days		/	Maintenance personnel	1 000 € net excl. tax
F-EX-10 Page 15			3 days				3 000 € net excl. tax
F-EX-11 Page 16			3 days				3 000 € net excl. tax
F-EX-12 Page 17			1 days				1 200 € net excl. tax
TA-EX-13 Page 18			2 days				2 000 € net excl. tax
F-EX-14 Page 19			1 days				1 000 € net excl. tax

SYSTEMS BETWEEN 150 KG AND 1500 KG OF AMMONIA (LOWER): SYSTEM SUBJECT TO “DECLARATION”

Order of 19 November 2009 amended Order of 29 May 2015

4.2. Personal protection

Operating personnel are trained in the use of this equipment.

(Personal protection equipment designed to protect against the risks presented by the installation and allowing intervention in the event of an accident)

4.7. Safety instructions

Operating personnel are trained on the risks presented by the storage or use of ammonia, and on the measures taken to avoid them. They know the procedures to follow in an emergency and do drills at least every two years.

SYSTEMS WITH MORE THAN 1500 KG OF AMMONIA: INSTALLATION SUBJECT TO “APPROVAL”

Article 54 of the Order dated 16 July 1997

“The operator must ensure its staff is professionally qualified and has been given safety training.

A special training course is provided for personnel running or supervising refrigeration systems and for personnel not specifically assigned to such duties but liable to intervene in them.

This course must among other things include:

- all the relevant information about ammonia;
- the explanations needed to fully understand the instructions;
- periodic simulation exercises to implement the safety instructions specified by this order, and regular training in the handling of the protection and intervention equipment allocated to their establishment. At the request of the inspector of classified facilities, the operator must provide proof that these exercises have been duly carried out;
- **periodic training in running refrigeration systems in situations of compromised safety, and in carrying out maintenance on them**”.

CRAM AND INRS RECOMMENDATION (ARTICLE R242) CONCERNING ALL AMMONIA INSTALLATIONS

8. Personnel information and training

8-1. Periodically instruct personnel liable to be exposed to risks arising in the operation of the system and the use of refrigerant. It is stipulated that users of systems running on ammonia must be trained every 6 months in view of the risks and hazards.

This article R242 also concerns refrigeration systems running on CFCs/HCFCs/HFCs.

Article R242 of the CRAM is a supplement to the Labour Code (see INRS ED 832) and enshrines best refrigeration industry practice.

EQUIPMENT UNDER PRESSURE

Order of 20 November 2017 on the operation of equipment under pressure.

PART II: INSTALLATION AND OPERATING CONDITIONS. Article 5

Personnel in charge of managing equipment under pressure **must be well-informed and qualified to supervise it and take all the measures required to operate it safely.**

For equipment under pressure meeting the criteria stated in article 15 (paragraph 1) of this order, the said personnel must be officially recognized as being suitably qualified for such management by their operator and periodically confirmed in this function.

EMPLOYER'S OBLIGATIONS

Article L4121-1 of the Labour Code

The employer takes the necessary measures to ensure the safety and protect the physical and mental health of workers.

These measures include:

- 1° Occupational hazard prevention measures;
- 2° Information and training measures;
- 3° Putting in place a suitable organization and resources.

The employer must adapt these measures to changing circumstances and seek to improve existing situations.

LEGIONELLA

Facilities classified for the protection of the environment Cooling towers and evaporative condensers - order of 14 December 2013

[...] These courses at the very least cover:

- conditions of proliferation and dispersion of Legionella;
- the related preventive, corrective and remedial measures (including the characteristics and strategy for using treatment products, and means of supervision);
- the provisions of this order.

In addition, the operators concerned follow a specific course dealing with sampling arrangements with a view to analysing the concentration of Legionella pneumophila. [...].

REFRIGERATION SYSTEMS RUNNING ON AMMONIA OR WITH COMPOUND CHLOROFLUORO COMPOUNDS (INRS/Social Security)

Article R242 - Points 8 - 8.1 - 8.2 - 8.3

8. Personnel information and training

8.1 Periodically instruct personnel liable to be exposed to risks arising in the operation of the system and the use of refrigerant:

- about the layout of emergency exits and where applicable how they work,
- about what action to take in the event of a gas or fire alarm,
- about using fire and refrigerant protective equipment.

8.2 - Train a response team (among the workforce or among each shift if the company works continuously) whose members, selected for their ability and already instructed in accordance with paragraph 1 of this article, are familiar with the emergency maneuvers specified in article 8 and with first aid.

Requirements:

- this team must be well-informed about the specific properties of the refrigerant and its risks, as well as any specific types of first aid required,
- the division of tasks required for emergency maneuvers must be by name, so that everyone knows exactly what they have to do in the event of a serious incident.

8.3 - This response team must undergo periodic training, at least half-yearly, to reduce the risks of hesitation, confusion or even panic.