

EUROPASS CERTIFICATE SUPPLEMENT

TITLE OF THE DIPLOMA

Técnico en Instalaciones Frigoríficas y de Climatización

TRANSLATED TITLE OF THE DIPLOMA (EN)⁽¹⁾

Technician in Refrigeration and Air Conditioning Installations

(1) This translation has no legal status

DIPLOMA DESCRIPTION

The holder of this diploma will have acquired the general competence with regard to:

Assembling and maintaining refrigeration, air conditioning and ventilation installations applying current legislation and protocols on quality, safety and labour risk prevention, guaranteeing their functionality and respect for the environment.

Within this framework, the PROFESSIONAL MODULES and their respective LEARNING OUTCOMES acquired by the holder are listed below.

"Thermal Machinery and Equipment"

The holder:

- Recognises the magnitudes and the values which determine thermal equipment operation, relating such magnitudes and values to the equipment performance and comparing them with the equipment operating characteristics.
- Calculates thermal loads in refrigeration, air conditioning and heating installations, justifying the proceedings and the results obtained.
- Recognises heat generation processes by analyzing combustion principles, solar radiation and their application field.
- Prepares the refrigeration cycle of an installation, interpreting refrigeration diagrams and obtaining the energy balance.
- Selects the cooler types used in refrigeration equipment, consulting technical documentation and describing their applications.
- Recognises real thermal machinery and equipment and their elements, describing the function each one performs within the ensemble.
- Recognises the components of a refrigeration installation (heat exchangers and expansion devices, amongst others), describing their operation principles, characteristics and field of application.
- Recognises the elements of a heating and domestic hot water (DHW) installation, describing their operation principles, characteristics and field of application.
- Recognises different types of chambers and refrigeration installations, describing their conformation and field of application.

"Installation Assembly Techniques"

The holder:

- Determines the process to be followed for machining and joining operations, analysing the technical documentation for the assembly drawings of pipe and iron fitting sets.
- Draws parts and sets of pipes, accessories and fittings of installations for their construction and assembly, applying representation techniques and using CAD programmes.
- Applies anti corrosion and anti oxidation treatments, describing the properties of the materials used in installations.
- Manually mechanizes installations elements, relating the machine operation to the conditions of the process and the product features.
- Shapes sheets, tubes and installations' profile, analyzing their geometry and dimensions and applying the appropriate techniques (cut and bend, amongst others.)
- Carries out non-welded joints, identifying the features of each joint, and applying the suitable techniques for each type of joint (threading, screwing and crimping, amongst others).
- Welds elements of installations, analyzing the materials to join and applying soldering techniques (soft, oxy-acetylene and electric welding) both manually and automatically.
- Complies with the rules on labour risk prevention and environmental protection, identifying the associated risks and the measures and equipment to prevent them.

"Electric Installations and Automatism"

The holder:

- Assembles control and drive circuits with characteristic components, interpreting schemes and verifying its operation.
- Draws electric board and installation schemes applying the regulations and drawing conventions.
- Assembles associated electric boards and systems, interpreting schemes and justifying each element's function within the group.
- Assembles and disassembles electric motors identifying their components and describing their function within the group.
- Connects the motors with auxiliary control, protection and speed regulation elements, interpreting schemes and verifying their operation.
- Measures magnitudes and carries out electric safety checks, acting on equipment and installations in operation and interpreting the results.
- Finds and repairs malfunctions in the boards and in the electric installation, identifying the causes that produce them and relating them to the symptoms showed.
- Assembles simple automatic systems with programmable controllers, interpreting schemes and verifying the execution of the control programme.
- Complies with the rules on labour risk prevention and environmental protection, identifying the associated risks and the measures and the equipment to prevent them.

"Configuration of Refrigeration and Air Conditioning Installations"

The holder:

- Recognises the components and obtains the technical features of refrigeration and air conditioning installations, interpreting the technical documentation and describing its function.
- Determines water distribution and air ducts networks for small air conditioning installations, analysing their features and selecting their elements.
- Configures low power refrigeration installations, selecting the equipment and elements, and justifying the choice according to their field of application and regulations in force.
- Configures low power air conditioning installations, selecting the equipment and elements and justifying the choice according to their field of application and regulations in force.
- Draws plans and functional block diagrams of installations interpreting and applying the specific symbols and the relevant representation conventions.
- Prepares technical and administrative documentation, interpreting the regulations and filling in the documents in preset formats to legalise low power installations.

"Assembly and Maintenance of Commercial Refrigeration Equipment"

The holder:

- Assembles basic refrigeration installations, applying assembly techniques and interpreting schemes and instructions.
- Assembles electric elements for protecting and controlling basic refrigeration installations and commercial equipment, interpreting schemes and instructions.
- Carries out the commissioning of basic refrigeration installations and the commercial equipment, checking out the working parameters.
- Carries out maintenance operations on basic refrigeration installations and commercial equipment, interpreting and applying manufacturer's maintenance instructions and recommendations.
- Diagnoses breakdowns and dysfunctions in commercial equipment and basic refrigeration installations, applying detection techniques and relating the dysfunctions to their causes.
- Repairs commercial equipment and basic refrigeration installations, applying corrective maintenance techniques.
- Complies with the rules on labour risk prevention and environmental protection, identifying the associated risks and the measures and the equipment to prevent them.

"Assembly and Maintenance of Industrial Refrigeration Installations"

The holder:

- Assembles elements and equipment in industrial refrigeration installations, applying assembly techniques and interpreting plans and the manufacturer's instructions.
- Carries out sealing tests on the installation, applying and assessing the technical and regulatory criteria.
- Assembles boards, electric installations and automatic systems associated to industrial refrigeration installations, interpreting plans and manufacturer's instructions and applying building techniques.
- Carries out the commissioning of the industrial refrigeration installation, describing and applying preliminary tests (operating protocol) to check the operation of the installation.
- Carries out preventive maintenance operations of industrial installations, interpreting maintenance plans and equipment manufacturer's recommendations.

- Diagnoses breakdowns and dysfunctions in industrial equipment and installations, applying detection techniques and relating dysfunctions to their cause.
- Repairs the elements and the equipment in industrial refrigeration installations, applying corrective maintenance techniques and procedures.
- Complies with the rules on labour risk prevention and environmental protection, identifying the associated risks and the measures and the equipment to prevent them.

"Assembly and Maintenance of Air Conditioning, Ventilation and Extraction Installations"

The holder:

- Assembles air conditioning equipment and the refrigeration circuit, interpreting plans and the manufacturer's instructions and applying the assembly techniques.
- Assembles water distribution networks for air conditioning installations, applying assembly procedures and using the appropriate means and techniques.
- Installs air distribution duct network, interpreting plans or schemes and applying path, cutting and building techniques.
- Carries out sealing tests on the different circuits of the installation, applying and describing the technical and regulatory criteria.
- Assembles electric switchboard and installations as well as the automatic systems associated to air conditioning installations, interpreting its plans and the manufacturer's instructions and applying building techniques.
- Carries out the commissioning of the installation, justifying the operations to be performed and verifying the installation parameters.
- Carries out preventive maintenance operations, interpreting an action plan and following the manufacturers' recommendations.
- Diagnoses breakdowns and dysfunctions in industrial equipment and installations, applying detection techniques and relating the dysfunction to their cause.
- Repairs the elements and the equipment in air conditioning, ventilation and extraction installations, applying corrective maintenance techniques and procedures.
- Complies with the rules on labour risk prevention and environmental protection, identifying the associated risks and the measures and the equipment to prevent them.

"Professional Training and Guidance"

The holder:

- Selects job opportunities, identifying the different labour integration possibilities, and lifelong learning alternatives.
- Applies teamwork strategies, assessing their effectiveness and efficiency on the achievement of the company's goals.
- Exercises rights and complies with the duties derived from labour relationships, recognising them in the different job contracts.
- Determines the protective action of the Spanish Health Service in view of the different covered eventualities, identifying the different types of assistance.
- Assesses the risks derived from his/her activity, analysing the job conditions and the risk factors present in his/her labour setting.
- Participates in the development of a risk prevention plan in small enterprises, identifying the responsibilities of all the agents involved.
- Applies protection and prevention measures, analysing risk situations in the labour setting of the Technician in Refrigeration and Air conditioning Installations.

"Business and Entrepreneurial Initiative"

The holder:

- Recognises the skills related to the entrepreneurial initiative, analysing the requirements derived from the different job positions and business activities.
- Defines the opportunity of creating a small enterprise, assessing the impact on the sphere of action and incorporating ethic values.
- Carries out the activities for the setting-up and the implementation of a company, choosing the legal structure and identifying the associated legal obligations.
- Carries out the basic administrative and financial management activities of an SME, identifying the main accounting and tax obligations and filling in documentation.

"Work Placement"

The holder:

- Identifies the structure and the organization of a company relating both to the production and marketing of the assembled or repaired installations
- Applies ethical and work habits in the development of his/her professional activity, according to the job characteristics and the procedures established by the company.

- Assembles refrigeration and air conditioning installations, following the quality system processes established by the company and the corresponding safety protocols.
- Carries out the preventive maintenance operations of the installations under the company's responsibility, applying the corresponding maintenance plans.
- Participates in the diagnosis and repair of breakdowns and dysfunctions in equipment and installations, applying corrective maintenance techniques and procedures.
- Participates in the start-up of the installations made by the company and the equipment under its responsibility
- Participates in the configuration and legalisation tasks for small installations, drawing sketches and plans, and filling in necessary documents

RANGE OF OCCUPATIONS ACCESIBLE TO THE HOLDER OF THE DIPLOMA

The Technician in Refrigeration and Air conditioning Installations works in the industries of assembly and maintenance of thermal and fluid installations related to the sub-sectors of commercial refrigeration, industrial refrigeration and air conditioning in the building and civil work sector and in the industrial sector.

The most relevant occupations or jobs are the following:

- Refrigeration fitter in commercial installations
- Refrigeration maintainer in commercial installations
- Refrigeration fitter in industrial processes
- Refrigeration maintainer in industrial processes
- Fitter/assembler of air conditioning, ventilation-extraction equipment, distribution networks and terminal equipment
- Maintainer/repairer of air conditioning and ventilation-extraction equipment, distribution networks and terminal equipment

AWARD, ACCREDITATION AND LEVEL OF THE DIPLOMA

Name of the body awarding the diploma on behalf of the King of Spain: Spanish Ministry of Education or the different Autonomous Communities according to their areas of competence. The title has academic and professional validity throughout Spain.

Official duration of the education/ training leading to the diploma: 2000 hours

Level of the diploma (national or international):

- NATIONAL: Post-Compulsory Secondary Education
- INTERNATIONAL:
 - Level 3 of the International Standard Classification of Education (ISCED3)
 - Level _____ of the European Qualifications Framework (EQF__).

Entry requirements: Holding the Certificate in Compulsory Secondary Education or holding the corresponding access test.

Access to next level of education/training: This diploma may provide access to Higher Technical Cycles provided that an entrance exam is passed.

Legal basis: Basic regulation according to which the diploma is established:

- Minimum teaching requirements established by the State: Royal Decree 1793/2010, of 30 December according to which the diploma of Technician in Refrigeration and Air conditioning Installations and its corresponding minimum teaching requirements are established.

Explanatory note: This document is designed to provide additional information about the specified diploma and does not have any legal status in itself. An Annex I may be added and will be filled in by the corresponding Autonomous Community.

INFORMATION ON THE EDUCATION SYSTEM

