

# EUROPASS CERTIFICATE SUPPLEMENT

## TITLE OF THE DIPLOMA (ES)

*Técnico en Instalaciones Eléctricas y Automáticas*

## TRANSLATED TITLE OF THE DIPLOMA (EN)<sup>(1)</sup>

*Technician in Electrical and Automatic Installations*

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(1) This translation has no legal status.

## DIPLOMA DESCRIPTION

**The holder of this diploma will have acquired the General Competence with regard to:**

Fitting and maintaining telecommunication infrastructures in buildings, low voltage electrical installations, electric machines and automated systems, applying current legislation, quality, safety and labour risk protocols, 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:**

### “Industrial Automatism”

The holder:

- Determines the process to be followed in the machining operations interpreting plans and using technical documentation.
- Draws basic elements and groups applying normalisation.
- Performs machining operations applying measuring and scribing techniques and using machinery and tools.
- Configures basic control and power circuits, selecting their elements and preparing sketches.
- Installs automated circuits for small engines manoeuvres interpreting sketches and verifying how they work.
- Installs associated electric boards and systems, interpreting technical documentation and verifying how they work.
- Finds breakdowns and malfunctions in the electrical installation, analysing symptoms and identifying the causes that produce them.
- Repairs breakdowns and malfunctions in the electrical installation, fitting and replacing damaged elements.
- Installs and maintains automatic programmable control systems interpreting technical documentation and verifying how they work.
- Complies with the rules on labour risk prevention and environmental protection, identifying associated risks and measures and equipment to prevent them.

### “Electronics”

The holder:

- Recognises combinational logic circuits determining their characteristics and applications.
- Recognises sequential logic circuits determining their characteristics and applications.
- Recognises rectifier and filter circuits determining their characteristics and applications.
- Recognises power supplies determining their characteristics and applications.
- Recognises amplifier circuits determining their characteristics and applications.
- Recognises power electronic systems verifying their characteristics and how they work.
- Recognises timer and oscillator circuits verifying their characteristics and how they work.

### “Electrotechnics”

The holder:

- Makes calculations in direct current circuits, applying basic electricity principles and concepts.
- Recognises the basic principles of electromagnetism, describing the interactions among magnetic fields and electrical conductors and relating Faraday’s Law with the principle governing how electric machines work.
- Makes calculations in alternating current (AC) single-phase circuits, applying the most appropriate techniques.
- Makes calculations of basic electrical magnitudes in three-phase systems, recognising the type of system and the nature and type of receiver connection.
- Recognises the risks and effects of electricity, relating them with the protection mechanisms that must be used and the calculations of the electrical installation.
- Recognises the characteristics of transformers carrying out tests and calculations and describing their constituting elements and how they work.

- Recognises the characteristics of direct current machines carrying out tests and describing their constituting elements and how they work.
- Recognises the characteristics of alternating current rotary machines carrying out tests and describing their constituting elements and how they work.

### **“Interior Electrical Installations”**

The holder:

- Installs basic electrical circuits interpreting technical documentation.
- Installs the electrical installation of a house with a basic degree of electrification applying the Spanish electro technical low voltage regulation (REBT).
- Drafts the technical report on the electrical installation of a house with a high degree of electrification in accordance with the REBT.
- Installs the electrical installation of a public building, applying specific regulations and justifying each element within the group.
- Installs the electrical installation of industrial facilities in accordance with the REBT.
- Maintains interior electrical installation applying electrical measurement techniques and relating malfunctions with the causes that produce them.
- Verifies the commissioning of the electrical installation in a public building or industrial facility in accordance with the specifications of personnel authorised by the REBT.

### **“Distributed Electrical Installations”**

The holder:

- Identifies the configuration and types of transformation centres, describing the characteristics and functions of each element.
- Identifies the configuration of a low voltage distribution network recognising their components and describing the characteristics according to the type electrical installation.
- Configures link installations selecting their constituting elements and placement.
- Recognises maintenance procedures in transformation centres analysing protocols and identifying activities.
- Performs operations of fitting and maintenance of a low voltage overhead network describing them and applying the corresponding techniques.
- Performs operations of fitting and maintenance of a low voltage underground network describing them and applying the corresponding techniques.
- Performs operations of fitting and maintenance of link installations describing them and applying the corresponding techniques.
- Complies with the rules on labour risk prevention and environmental protection, identifying associated risks and measures and equipment to prevent them.

### **“Common Telecommunication Infrastructures within Houses and Buildings”**

The holder:

- Identifies the elements of common telecommunication infrastructures within houses and buildings, analysing their constituting systems.
- Configures installations in common telecommunication infrastructures within houses and buildings, determining their constituting elements and selecting components and equipment.
- Installs installations in common telecommunication infrastructures within houses and buildings, interpreting technical documentation and applying fitting techniques.
- Verifies and adjusts the constituting elements of installations in common telecommunication infrastructures measuring significant parameters and interpreting their results.
- Finds breakdowns and malfunctions in equipment and installations in common telecommunication infrastructures applying detection techniques and relating the malfunction with the causes that produce the same.
- Repairs installations in common telecommunication infrastructures applying corrective techniques and, in case of malfunction, techniques for the replacement of components taking into account the manufacturers’ recommendations.
- Complies with the rules on labour risk prevention and environmental protection, identifying associated risks and measures and equipment to prevent them.

### **“Home Automation Installations”**

The holder:

- Identifies automatic areas and systems that constitute automated installations in houses, analysing how they work, characteristics and applicable rules.
- Configures technical systems, justifying why they are chosen and recognising how they work.
- Installs home automated installations in houses, describing their constituting elements.
- Installs control areas of home automated installations following the established procedures.
- Maintains home automated installations in accordance with the specifications of the system.
- Diagnoses breakdowns and malfunctions in home automation equipment and installations, applying measuring techniques and relating them with the causes that produce them.

- Complies with the rules on labour risk prevention and environmental protection, identifying associated risks and measures and equipment to prevent them.

### **“Photovoltaic Solar Installations”**

The holder:

- Identifies the elements that configure photovoltaic solar energy installations, analysing how they work and their characteristics.
- Configures photovoltaic solar installations justifying their constituting elements.
- Installs photovoltaic solar panels assembling their elements and verifying how they work.
- Installs photovoltaic solar installations interpreting technical documentation and verifying how they work.
- Maintains photovoltaic solar installations applying prevention and detection techniques and relating malfunctions with the causes that produce them.
- Recognises the conditions for connection to the grid of photovoltaic solar installations in accordance with applicable rules.
- Complies with the rules on labour risk prevention and environmental protection, identifying associated risks and measures and equipment to prevent them.

### **“Electric Machines”**

The holder:

- Prepares technical documentation of electric machines relating normalised symbols and representing elements and procedures graphically.
- Installs single-phase and three-phase transformers, assembling their elements and verifying their operation.
- Repairs breakdowns in transformers, making tests and adjustments for their operation.
- Installs rotary electric machines, assembling their elements and verifying their operation.
- Maintains and repairs electric machines making tests and adjustments for their operation.
- Carries out characteristic manoeuvres in rotary machines, interpreting sketches and applying fitting techniques.
- Complies with the rules on labour risk prevention and environmental protection, identifying associated risks and measures and equipment to prevent them.

### **“Professional Training and Guidance”**

The holder:

- Selects job opportunities, identifying the different possibilities of labour integration, and the alternatives of lifelong learning.
- 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 risks derived from his/her activity, analysing job conditions and risk factors present in his/her labour setting.
- Participates in the development of a risk prevention plan in a small enterprise, identifying the responsibilities of all agents involved.
- Applies protection and prevention measures, analysing risk situations in the labour setting of the Technician in Electrical and Automatic Installations.

### **“Business and Entrepreneurial Initiative”**

The holder:

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

### **“On the Job Training”**

The holder:

- Identifies the company's structure and organization, relating the same to the production and marketing of the products obtained.
- Applies labour and ethic habits in his/her professional activity according to the characteristics of the job position and the procedures established by the company.
- Installs low voltage electrical installations applying current legislation, safety and quality regulations of the company.

- Participates in the operations and stages of commissioning and service of installations and equipment following the established procedures.
- Carries out the preventive maintenance of the company's installations and equipment, applying the corresponding maintenance plans.
- Collaborates in the diagnosis and repair of breakdowns and malfunctions in installations and equipment, applying corrective maintenance techniques and procedures.
- Participates in the tasks of configuration and assessment of electrical installations and their legalization, preparing schemes and filling in the necessary documentation.

### **RANGE OF OCCUPATIONS ACCESSIBLE TO THE HOLDER OF THE DIPLOMA**

The Technician in Electrical and Automatic Installations works in small and medium enterprises, mostly private, in charge of fitting and maintaining telecommunication infrastructures in buildings, electric machines, automated systems, low voltage electrical installations and home automation systems, either being self-employed or an employee.

The most relevant occupations or jobs are the following:

- Electrical fitter-maintainer
- Buildings electrician
- Industrial electrician
- Maintenance electrician
- Home automation systems fitter-maintainer
- Aerial fitter-maintainer
- Telecommunications fitter in home buildings
- Telephone equipment and installations fitter-maintainer
- Photovoltaic solar energy installations fitter

### **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 177/2008, of 8 October, according to which the diploma of Technician in Electrical and Automatic 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

