

PROJECTX N° 021

“ELECTROTECHNIC WIRING HARNESS FOR A MOTOR STARTER”

PRESENTATION



Lycée Polyvalent
Isaac NEWTON

Promoting school:

Lycée Polyvalent Isaac Newton
Clichy. France



A. GENERAL DESCRIPTION

Title of the ProjectX

ELECTROTECHNIC WIRING HARNESS FOR A MOTOR STARTER

Core area

GENERAL / KNOWLEDGE	ELECTRICITY
PARTICULAR / ACTIVITY:	DESIGN, INDUSTRIAL EQUIPMENT

Promoting school

LYCEE ISAAC NEWTON

Schools participants in the revision of the ProjectX

SAVO
LYCEE ISAAC NEWTON
SCCB
XABEC
PITESTI

Reference to ECVET Credit System and EQF / NQF

ECVET	EQF	REFERENCE TO NATIONAL QUALIFICATIONS (NQF)						
		Spain	Finland	Romania	Portugal	UK	Turkey	France
2	4	4	4	3	4	3	4	4

Learning Outcomes achieved (to be developed in the future related with ECVET credit system)

1. Design an electrical circuit according to the need of industrial activities (Power and control circuits using 3 phase asynchronous motor)
2. Realise an industrial wiring harness

Time that is necessary to do the ProjectX (in hours)

Theory:	12 hours
Practice:	24 hours

Link to real companies in your region (it is just informative)

- | | |
|------------------------------------|-----------------------------------------------------------|
| 1. NAME: SHELL LUBRICANT. | WORKPLACE: FILLING MACHINE |
| 2. NAME: GEODIS CALBERSON SERVICES | WORKPLACE: PROVIDER OF PARCEL AND EXPRESS PARCEL SERVICES |



B. THEORY

Objectives of the theoretical Knowledge

1. To decipher a Technical schematic: function and components
2. To understand the technical requirements
3. To do a basic control and power circuit (with electrotechnic components)
4. To determine the amp size of the circuit breaker, fuse, contactor and thermal overload relay
5. To choose correctly type of fuse: aM, gG
6. To understand a time-current tripping curve of a fuse or circuit-breaker

List of activities

1. Create a motor starter schematic with an electrotechnic circuit design software (Qelectrotech freeware)
2. Explain the teacher how does it work
3. Check the working order of the motor starter in simulation mode.

C. PRACTICE

Brief description of the Practice

1. The objective is to wire a motor starter.
 - a) Direct on line motor starter
 - b) Star-delta motor starter
2. Must have the ability to verify if we have the good working order according to the specifications

Steps or activities to be performed by the student

- First: Distinguish different part of the wiring harness on the schematics: control circuit and power circuit
- Second: Choose the correct wire gauge
- Third: Do the “electrical risk analysis” (electrician’s certification?)
- Fourth: Wire properly all the components by using the correct tools (plyers, minus/plus screwdriver ...)
- Fifth: Check proper working of the motor starter
- Sixth: If not, perform properly with the multimeter some measures to fix the wiring harness.



D. DETAILED DESCRIPTION OF LEARNING OUTCOMES.

Learning Outcome:	To Design an electrical circuit according to the need of industrial activities (Power and control circuits using 3 phase asynchronous motor)
Knowledge	
<ul style="list-style-type: none"> - He / she knows function and components (circuit breaker , fuse , contactor , thermal relay) - He / she knows the sizing of the components according to the motor power - He / she knows the rules to design an electrical circuit - He/she knows the characteristics of several Motor starters 	
Skills	
<ul style="list-style-type: none"> - He / she knows to decipher technical specifications - He / she is able to design a control circuit - He / She is able to design a power circuit - He / She validates the conformity of the schematics according to the specifications 	
Competences	
<ul style="list-style-type: none"> - He / she can use an electrical design software - He / she can translate specifications into electrical schematics - He / she can design an electrical blueprint using standards symbols and rules - He / she asks questions for clarification appropriate and reasonable and listens carefully to the instructor 	



Learning Outcome:	Realize an industrial wiring harness
Knowledge	
<ul style="list-style-type: none"> - He / she knows the necessary occupational safety regulations, accident prevention, regulations and environmental protection regulations - He / she knows the difference between control circuit / power circuit - He / she knows the various electrotechnic symbols - He / she can explain wiring process - He / she knows the choice of wire gauge (size) - He / she knows how to choose the appropriate tools for wiring - He / she knows the different symbols and letter used in electrotechnics / cross reference - He / she knows the general rules for wiring activities - He / She knows the procedure for electric verification 	
Skills	
<ul style="list-style-type: none"> - He / she complies with the safety electrical measures - He / she organizes the components on the electric board - He / She wires components with different types of cables (size and colour) - He / She tags wired components on the drawing - He / she chooses the correct wiring procedures - He / she checks connexion tightness 	
Competences	
<ul style="list-style-type: none"> - He / she chooses the correct wiring procedures - He/she uses the correct tools - He / she selects the correct wire gauge - He / she shall organize the work steps for the wiring harness - He / she checks the achievement of the wiring - He / she checks the good working order according to the specification - He/she fixes the potential problems - He / she documents the conformity sheet - He / she asks questions for clarification appropriate and reasonable and listens carefully to the instructor 	

