Process and Safety Assignment

Part of the minor Industrial Automation MINAU

Course owner:	Bas de Bruijn
Lecturers:	Bas de Bruijn
Number of credits for this course:	5 EC
Place in the ME-programme:	Y3 / Q 1
Course code:	L.29594
Examination code:	T.
Date/Version:	20230901

1. Introduction

The assignment given to your group is part of the course “Process and Safety” from the minor Industrial Automation. For successful completion of this course you’ll implement the solution to an assembly problem on hardware.

During the course you’ll follow lectures on the subjects of “Process”, “Safety” and “Components” and the knowledge you obtain during those lectures will be necessary for the implementation.

Please read the course description carefully to get an understanding of the level/detail necessary for the examination of this course.

Taken from the course description:

You’ll be given an assignment to analyze, document and implement an assembly process. You’ll have to implement the process by constructing an assembly jig, programming a PLC, have it communicate with an industrial robot. During this process you’ll have to apply your recent acquired knowledge on electrical components, electrical drawings, risk assessment, safety and defining processes and interfaces.

2. Objective

Create a setup for assembling a valve used in central heating systems or gas lines from its individual parts to a complete product. This valve will be given to your group and you must work as a group to solve this problem.

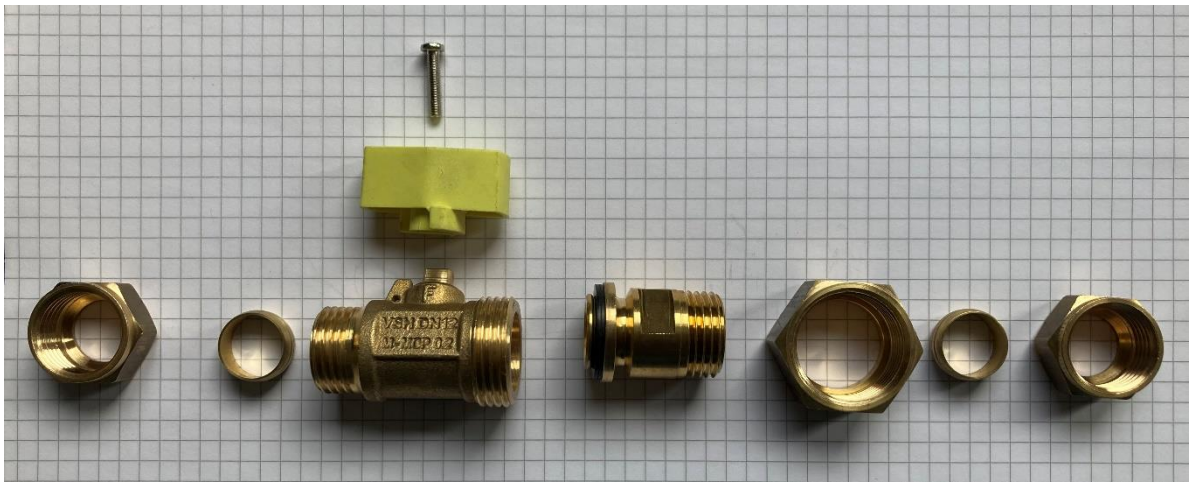
Your group shall be self-directing. Next to implementation of your solution you will be rated for professional skills that you have learned in some form of project from your current education. This means that this project can be done in the way that will suit the group best, without detailed rating on project management details. At the same time, when you do nothing about project management tasks your solution is doomed to fail.

Your solution:

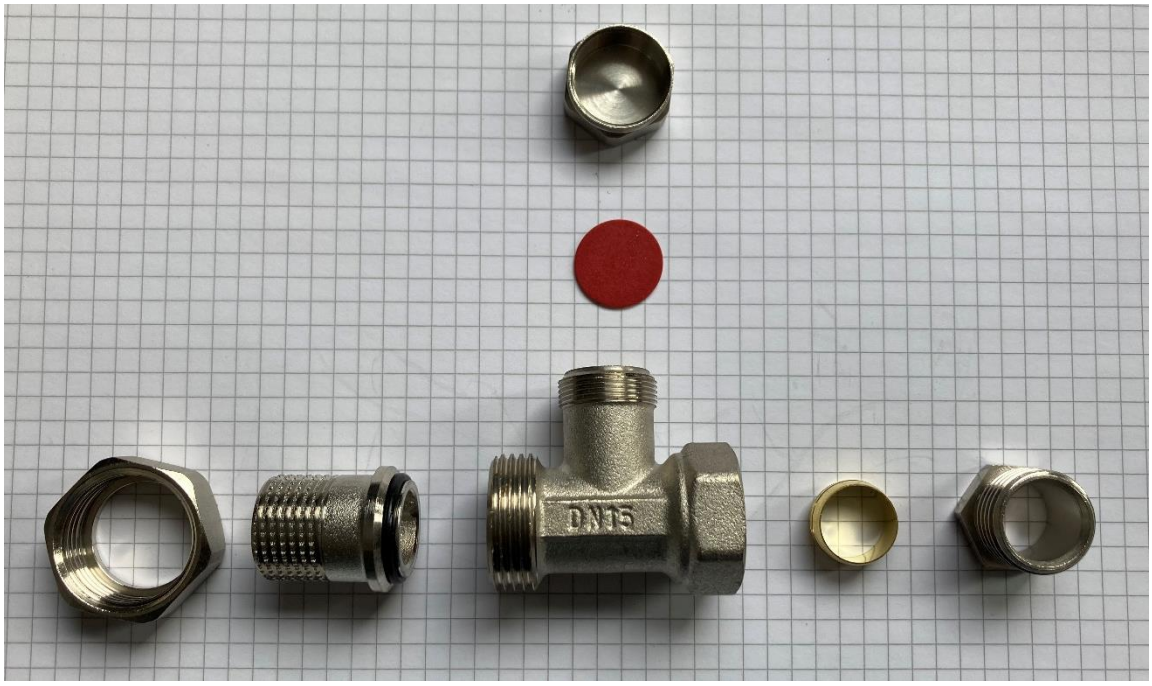
- Will be programmed on a PC capable of running TwinCAT 3 software for the Beckhoff EtherCAT bus. You'll be able to use Digital/Analog/IOLink module(s). This hardware will be provided by Saxion.
- Will be fully built, including mechanical parts and electrical wiring. Components needed for the solution must be discussed with the Instructor.
- Must interact with the ABB industrial robot table.
- Must be built on a removable base.
- The base must contain a fixed jig/cassette so an operator can manually load new parts and unload the assembled product while in operation.
- Design parts for proper interfacing between parts, jig, robot(gripper). This is not in the rating criteria, but is part of knowledge you as a group should have mastered.
- Must be properly documented. Please look at details in the rating criteria of the rubric provided in the course description.

3. Products

3.1. Product A: Gas valve



3.2. Product B: Radiator valve straight



3.3. Product C: Radiator valve angled