**Project no. 1: Control system for an electromechanical valve**

The customer demands a control system for an electromechanical valve (Fig. 1, Fig. 2), driven by electric drive with a permanent magnet synchronous motor (Fig. 3).

The requirements are stated as follows:
- The valve control should employ a smooth trajectory according an S-curve (Fig. 4) to achieve high valve saddles lifetime.
- The valve should be mainly controlled remotely from a PC station, but with a possibility to open or to close given valve locally at the place of installation using push-buttons.
- The actual valve state should be displayed on the PC and locally using LCD
- The valve should be protected against valve saddles damage by limiting the force during opening or closing. If the limited force is not enough to perform the operation, it is considered as a fault.
- The fault should be displayed on the PC, by the signal light and on the LCD
- The opening time $t_o$, the closing time $t_c$ and a maximal force $F_c$ should be settable by a user.

   The customer demands a complete software solution for an existing HW with source code (programming language C), including code documentation and user guide.



*Fig. 1: An example of a valve, suitable for control by an electric drive (Source: www.hydronix.sk)*
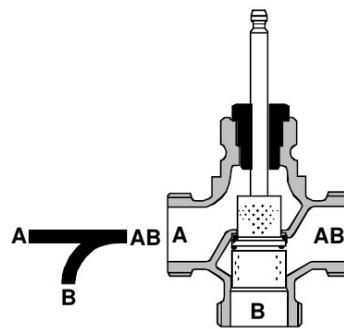


*Fig. 2: An example of valve cross-section (Source: www.hydronix.sk)*



*Fig. 3: An example of electric drive control for an electromechanical valve (Source: Siemens Acvatix VGX41… product sheet)*
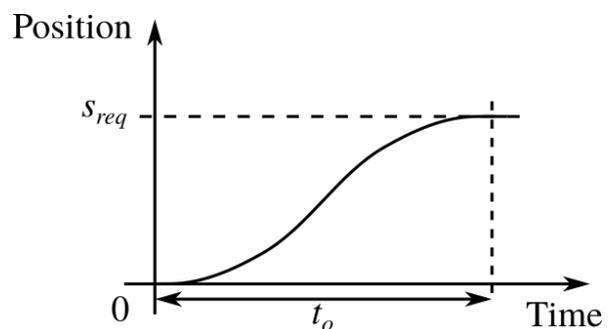


*Fig. 4: An example of the positioning trajectory*

**Task 1 – Missing information**




**Task 2 – Project management and time schedule 1**

**Roles assignment:**
(name) – (role)

1. ………………… - …………………………………………..
2. ………………… - …………………………………………..
3. ………………… - …………………………………………..
4. ………………… - …………………………………………..
5. ………………… - …………………………………………..
6. ………………… - …………………………………………..

**Time schedule - initial**

| Task & responsible person | Week | | | | | | | | | | | | |
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| | W1 | W2 | W3 | W4 | W5 | W6 | W7 | W8 | W9 | W10 | W11 | W12 | W13 |
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**Task 3 – Meeting  with customer - agenda**

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2. ………………………………………………………………..

3. ………………………………………………………………..

4. ………………………………………………………………..

5. ………………………………………………………………..

6. ………………………………………………………………..

7. ………………………………………………………………..

8. ………………………………………………………………..

## Task 4 – Firmware architecture and Time schedule revised

| Task & responsible person | Week | | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | W1 | W2 | W3 | W4 | W5 | W6 | W7 | W8 | W9 | W10 | W11 | W12 | W13 |
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