

# Automatic Control of PRESSURE & TIME of gas flow from H tank cylinders

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I have a gas cylinder – H Tank (that can hold oxygen, helium, etc... at 50 psi pressure) that is used for clinical simulation. It has its own valve that can be switched on / off manually.

1) My requirement is to automate this valve by having a controller to control the flow of gas in terms of both PRESUURE and TIME based on the user inputs.

2) Provide a set of knobs / digital input switches each for TIME period of gas flow – 2 seconds, 5 seconds, and 10 seconds.  
(If I choose 10 seconds TIME, the valve opens for 10 seconds, sends the gas and automatically shuts after 10 seconds)

3) Provide another set of knobs / digital input switches for the LAG period of gas flow – 10 seconds, 15 seconds, 25 seconds.  
(If I choose 15 seconds input, then the valve has to be in the closed mode for 15 seconds after which it automatically opens for TIME input that I have chosen in step 2)

4) Provide another set of knobs / digital input switches for the PRESSURE of gas flow – 25 psi, 35 psi, 50 seconds.  
(If I chose 25 psi, then the pressure of the gas coming out of the cylinder should be 25 psi)

5) My final extension is to control the same knobs / inputs remotely from my computer through a user interface

(Example, If I chose TIME = 5seconds, LAG = 10 seconds, PRESSURE = 25 psi, the gas flows out of the cylinder at a pressure of 25 psi for a 5 seconds period after a periodic 10 seconds break meaning 5sec ON, 10 sec OFF, 5 sec ON, 10 sec OFF, etc...)

Is there a readymade product that can handle this and what are the specifications\*\*\* that I should look for when I buy such a product ?

How do I approach if I would like to assemble my own system to handle

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my requirement and what would be the design ?

In order to handle from the computer remotely, I can connect using a serial / USB port, is there a free downloadable software that can convert the serial / usb signals to handle such requirements based on the circuit ?

I assume that I can have a timer and a pressure sensor to do this that again converts to mechanical energy in order to stop / open the valve and regulate the pressure. At the same time, I can also have some readymade PCBs that understand the serial /

usb signals that I send from my computer to do the job, but I need a very clear cut design with specifications and implementation procedure in order to execute this. What are the basic technical specifications that I have to look for in this new system ? I am basically looking for an economic solution that can be implemented in my lab for experiments.

Any pointers to this would be of greatest help.  
Thanks in advance!!!  
SARITA