Ain Shams university
Faculty of Engineering

4th year Mechatronics
2013-2014

Hydraulic and Pneumatic Control Laboratory

Clamping Device

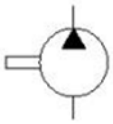
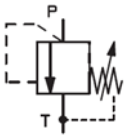
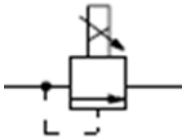
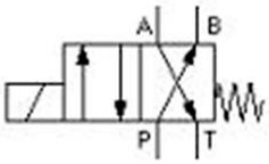
Name: ----------

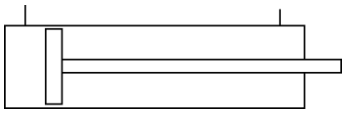
Presented to: Prof. Dr. / Magdy Abdel-Hameed

1. Objective

- Familiarization with a pressure stage control system.
- Ability to draw the hydraulic circuit diagram and to understand it.
- Construction of the control system (electrical wiring).
- Setting the proportional Pressure relief valve Value.

2. Hydraulic Components used

Uni directional Pump	
Filter	
Pressure relief valve	
Proportional pressure relief valve	
4/2 directional control valve	

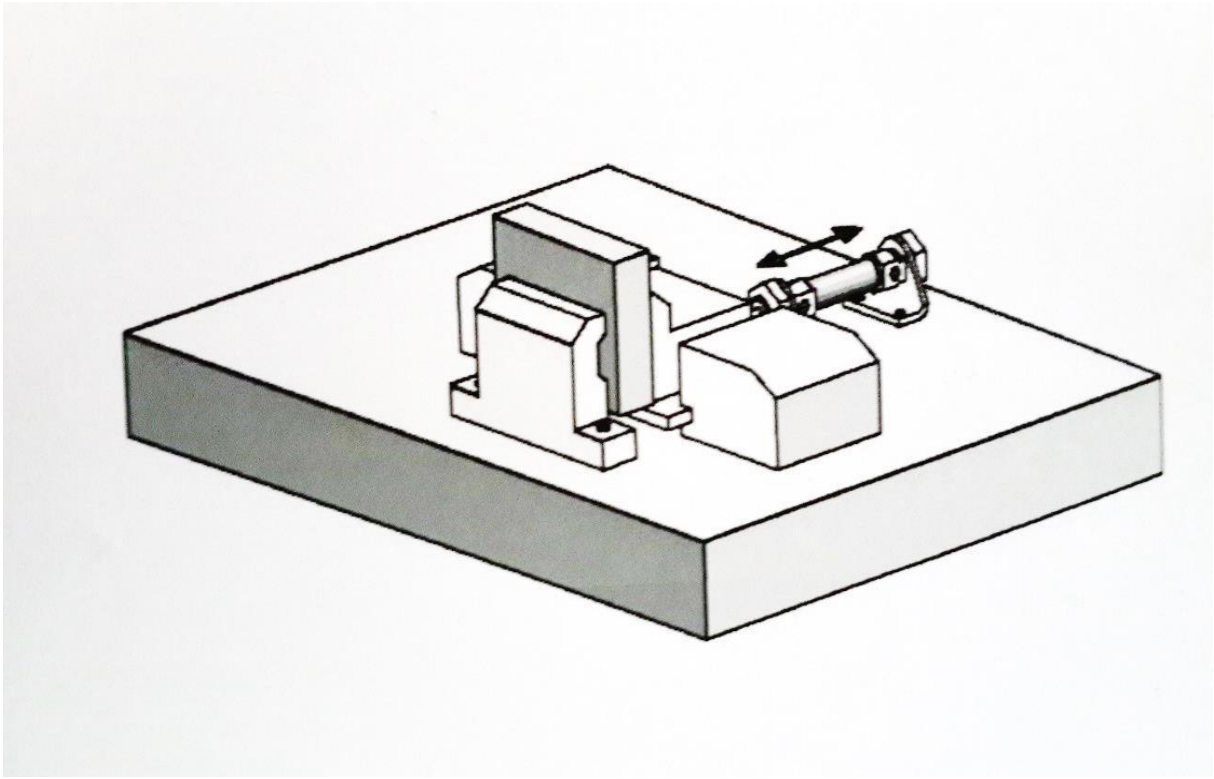
Double acting cylinder	

3. Description

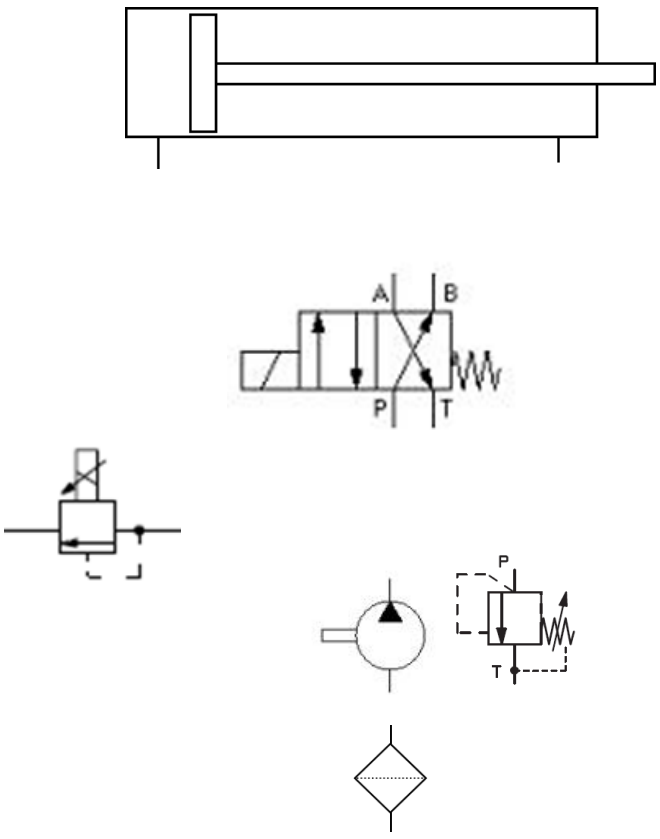
Work piece in different materials are to be clamped by means of a clamping device. It must be possible to adapt the clamping force to the material. The clamping force is to be generated via a hydraulic cylinder, whereby the system pressure is to be adjustable as required.

This is to be effected by means of a proportional pressure relief valve.

Once the clamping cylinder has extended, a specific is to build up. This pressure is to be maintained during the machining of the work piece. Only upon actuation of a push button is the pressure to drop and the cylinder to retract again.



4. Design of hydraulic circuit



5. Procedure steps

a. Connect the hydraulic components
b. Draw and connect the electrical wiring
c. Take the reading of the clamping pressure, set value and the amplifier current.
d. Repeat step c for different set values.

Set value W (Volt)								
Clamping Pressure P (Bar)								
Amplifier Current I_a (mA)								

4. Discussion

1. How to control Clamping Device by using proportional pressure relief valve?

.....
.....
.....
.....

2. What is the function of proportional pressure relief valve in the system?

.....
.....
.....
.....

3. What is the advantage of the proportional pressure relief valve compared with the manually operated relief valve?

.....
.....
.....
.....

4. How is it possible to set pressure-less pump recirculation by means of the proportional pressure relief valve?

.....
.....
.....
.....