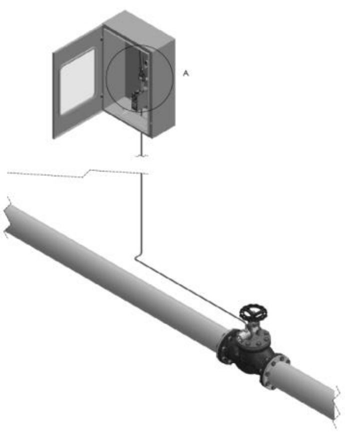
GC-system explained

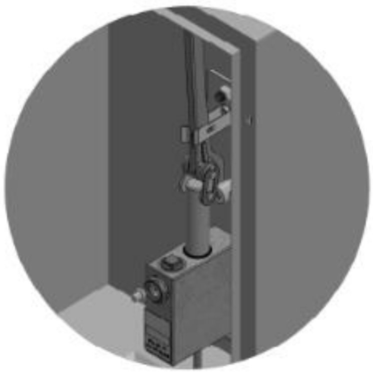
Purpose

This document serves to explain the system function and princips of the GC-system.

1. GC-system without header tank
2. GC-system with header tank

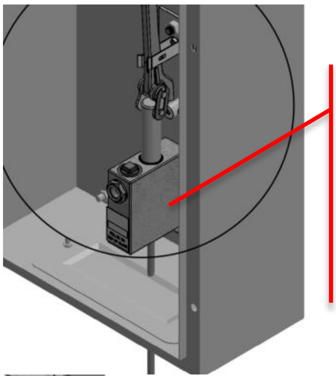
1. GC-system without header tank
   Standard system in which no valves are located higher than the GC-lever.
   The system can be comprised of 1 or many valves, note that each lever in the cabinet are able to activate up to 6 valves with release cylinders.
   If there is need of more than 6 valves ther has to be more than 1 lever to activate all the valves.





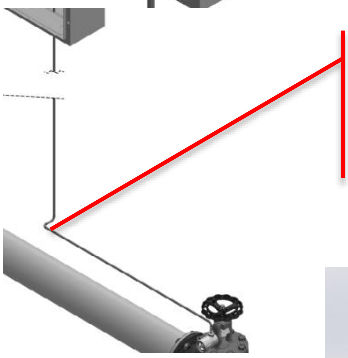
DETAIL A

Lever is not activated, it is locked in position by compression latch.

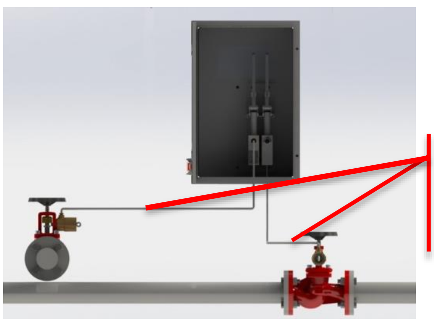


No active force on the working piston, connection between oil reservoir and working pressure chamber gives the same pressure in complete hydraulic system and complete system is vented through ventilation cavity on oil reservoir.

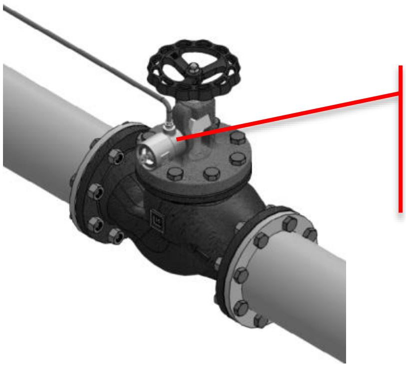
Static pressure in the oil reservoir = 0 bar



Depending on the height difference between the reservoir and the piping system the static pressure in the system will fluctuate depending on the height from the reference (http://hyperphysics.phy-astr.gsu.edu/hbase/pflu.html)

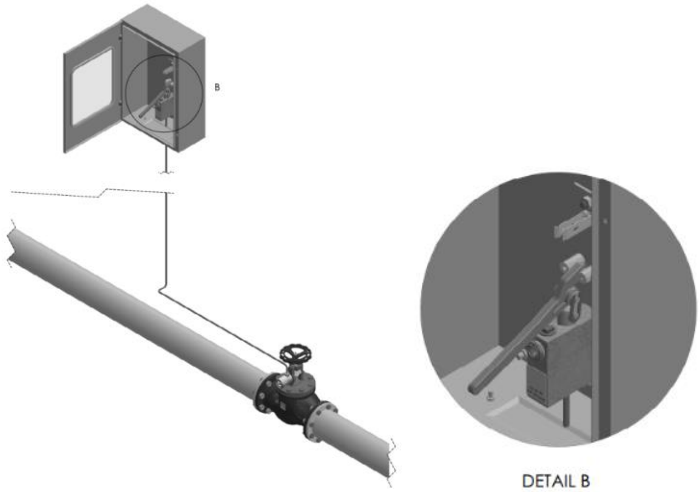


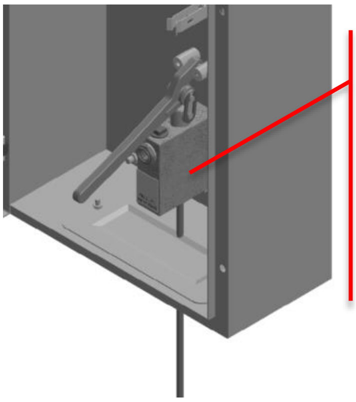
Small height difference but there are different static pressures in the pipes



Release cylinder, rated operating PN30, rated static pressure 4bar. The 4 bar static pressure is to accommodate the static pressure that builds up due to the height from the GC-lever oil reservoir.

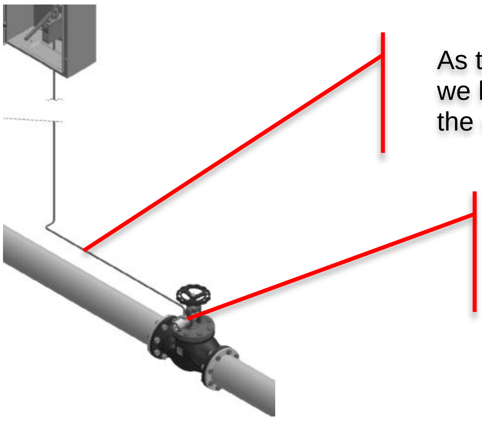
System has been activated by pulling the lever.





Active force on the working piston, connection between oil reservoir and working pressure chamber has been cut off.
Pressure in hydraulic piping system 20bar. Only oil reservoir is vented through ventilation hole.
The pressurized system is sealed.

Static pressure in the oil reservoir = 0 bar

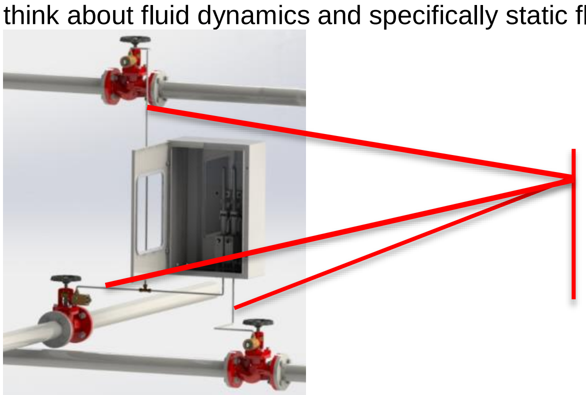


As the lever has been pulled we have working pressure in the system.

Release cylinder will be activated.

2. GC-system with header tank

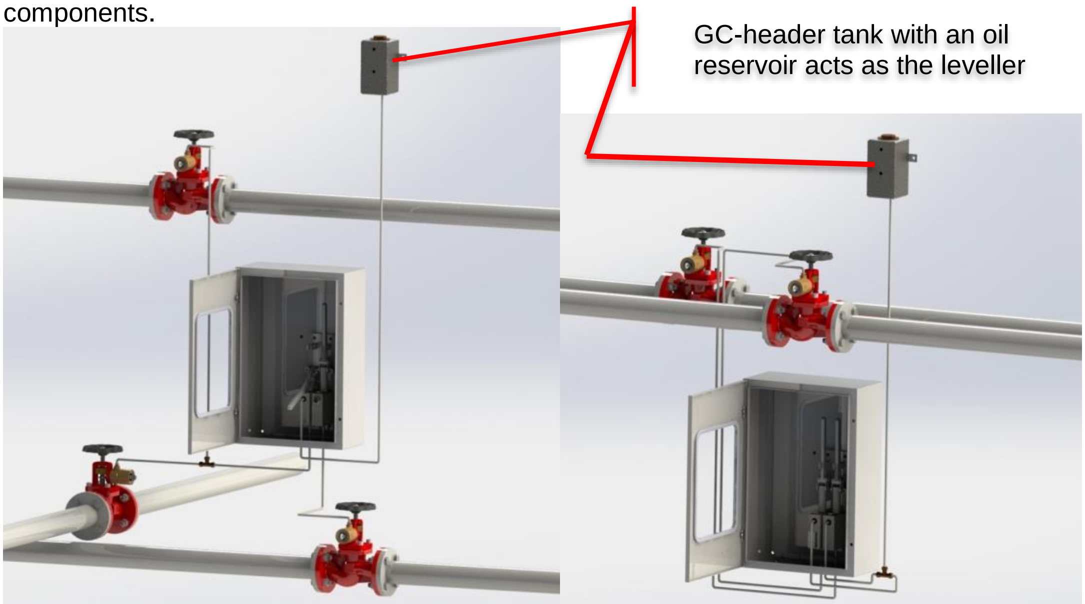
The basic principle is the same for this system as for the system above in this document. As there are valves with release cylinders located above the GC-lever with oil reservoir we need to think about fluid dynamics and specifically static fluid pressure.



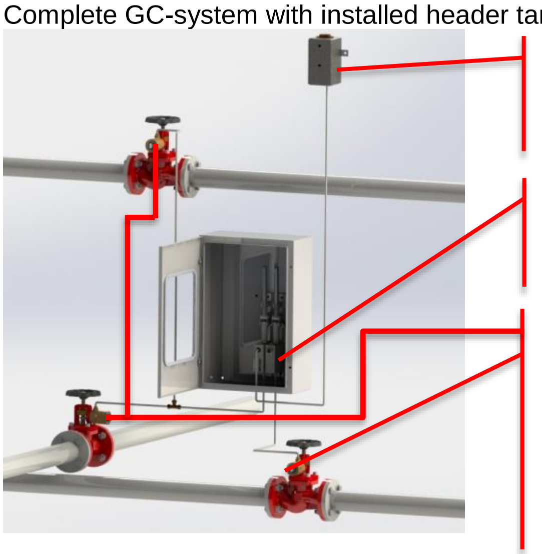
Static fluid pressure states that the different pillars of oil levels inside the piping wants to levele out to the same height.

To counter this effect we need to insert a fluid level that is higher than the needed pipes and valves. The solution to this is to insert a new oil reservoir than is located above all system components.

GC-header tank with an oil reservoir acts as the leveller



Complete GC-system with installed header tank.

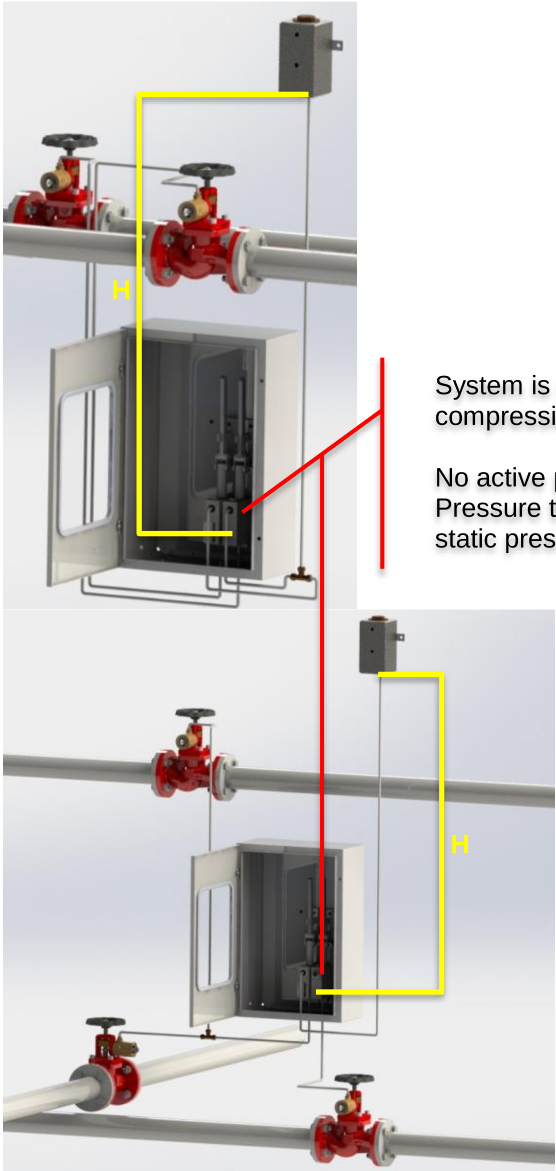


Header tank is installed at the highest point and serves all the installed pipes with oil and correct system levelling.

Oil reservoir in the GC-lever unit has a static pressure relative to the height between its oil reservoir and the header tank.

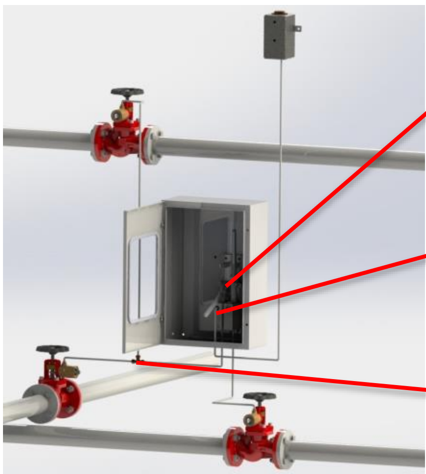
Static pressure at the release cylinders are relative to the height difference between the header tank and the various release cylinders.

Release cylinders are rated for a static pressure of 4 bar, that equals to a height pillar of 40m between the header tank and the cylinders.



System is not activated, lever is fixed by compression latch.

No active pressure from lever and working pistion. Pressure that has been built up in the system is the static pressure due to the height pillar H



The lever has been engaged and the working piston has pressed down more oil into pipes system. Activation of connected cylinders is done and valves auto shut.

Pressure in oil reservoie on the GC-unit is static pressure based on the height of the fluid pillar to the header tank.

Pressure in the connected pipe system is approx. 20bar