Student Experiments

Manual

AIR PRESSURE

P9160-4V

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INDEX

USING THE VACUUM CHAMBER

Consider following points before using the vacuum chamber:

- Check whether the gasket (black ring) is placed uniformally in the gauge of the upper rand of the base part
- Put the cover centrally on the chamber (not colaterally displaced)

- Screw the ventilation valve down

- Stick the blue hose into the valve
- Caution: after the first resistance, the hose has to be laterally moved further 3-4mm – finally the hose shall fit perfectly!

- Stick the other hose ending with the white adapter on the gas syringe by using hard pressure.

- Hold the gas syringe with one hand and pull the grip of the flask with the other hand.
- Pay attention on the hose staying loose fitting and also that you do not remove the cover at the beginning.

When pushing the flask, the valve beneath closes and the air escapes via the upper valve.

With every extraction you will see at the Manometer that the pressure in the chamber declines. The scale of the Manometer also shows you negative pressure!

- The lower the pressure the more you have to work when pumping.

If neccessary the hose can be removed from the valve:

- Press the blue plastics ring with fore – and middlefinger against the valve
- Simultaneaously, the hose can be easily removed

AIR PRESSURE MEASUREMENT

MELS 03

Required Kit:
P9902-4V Air pressure

Material:
1x Syringe plastics, 120ml
1x Vacuum hose plastics, SE
1x Vacuum chamber complete, 1000ml

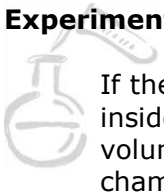
AIR PRESSURE MEASUREMENT

MELS 03

To act in time and also to avoid troubles simultaneously, you shall often watch and read off the values on the meters.
This can be the speed when driving as well as reading the temperature to diagnose whether there is a risk of frost existing. Another example would be to observe the pressure of liquids/gases to ensure that nothing explodes or to guarantee that enough power gets generated at a specific pressure level (hydraulic power units).

Preparations:
Consider the instructions how to use the vacuum chamber.

Experiment:



If the chamber is ready prepared and the syringe is connected, press the flask fully inside and finally extract it until 100ml is reached. As a result you have reduced the air volume by 1/10 and pressure is reduced by 1/10, for 100hPa. The pressure in the chamber is now 1000 hPa – 100hPa.

Now, continue with evacuating air from the chamber and watch the vacuummeter and the valves.
Note: the more the pressure inside the chamber decreases, the more the outer air pressure becomes noticeable and exertion gets higher. At a pressure level of 200hPa=1000hPa-200hPa it gets harder and harder to pull out the flask.

Task:
At which pressure level is it still possible to remove the cover more or less easily?

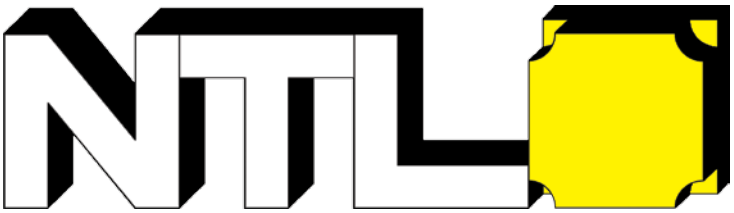
_____
900hPa / 800hPa / 600hPa

Conclusion:

With a Manometer (in this case a Vacuummeter, as only small pressure gets measured) you can measure air pressure.

Advice:
Meters for measuring air pressure are also called Barometers.

When the pressure in the chamber e.g. has halved, then in the course of one stroke only halve of air volume gets transported outside. Consequently, the pressure declines by 50hPa.
Generally speking, with every stroke the pressure inside the chamber declines by 1/10 of the existing inner level.



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