

Technical Data

Pressure piston, d = 16 mm

Press piston, d = 56 mm

Max. press cylinder movement with working accessories: 55 mm
(with cutting die): 35 mm

Water supply container: d = 200 mm

Volume: 300 ml

Model height: 320 mm

Material: acrylic glass, steel

Total weight: approx. 1650 g

Caution:

- This device may only be operated by qualified personnel or by persons they instruct in its use.

Supervision is obligatory!

- Take care that the device does not fall during repositioning, packing or unpacking. In the event this does occur, have the device repaired immediately by authorized service personnel.
- In the event that unforeseen difficulties arise during operation, immediately notify the dealer. A high risk of danger exists if the device does not operate without difficulty. Therefore, always take care that the device is set up on a stable surface.
- The device may be repaired only by authorized service personnel.
- Right to modifications and errors reserved

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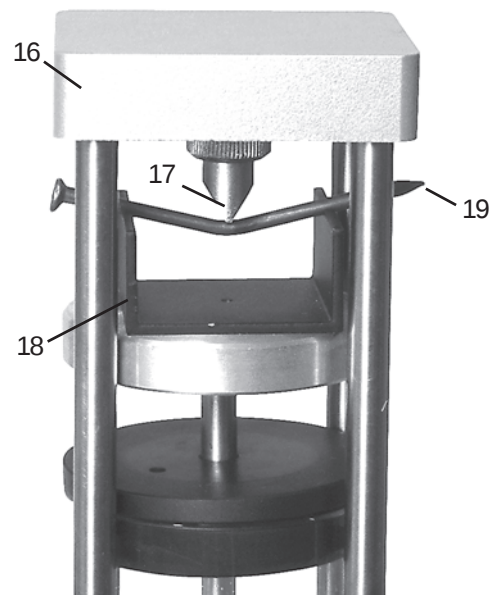
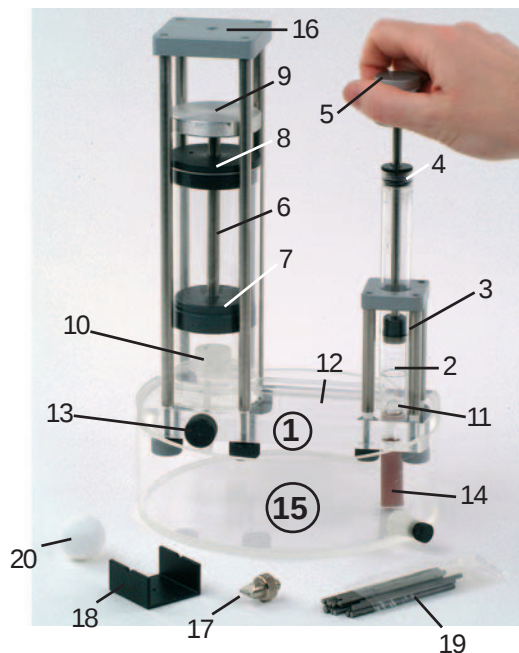


DM405-2P Hydraulic Press



Use:

Model for explaining by demonstration the functioning and working of a hydraulic press. This functional model allows real-life experiments, such as compressing objects, bending an iron nail, cracking a nut etc. to be performed. All working parts are clearly visible.



1 - Press frame

2 - Pressure cylinder

3 - Pressure piston

4 - Pressure piston sealing cap

5 - Pressure piston handle

6 - Press cylinder

7 - Press piston

8 - Press piston sealing cap

9 - Press piston plate

10 - Press piston outlet

Operation:

First the hydraulic press needs to be filled with water. To this end it is best to first hold the press frame (1) with the intake hose (14) pointing upward. By opening the knurled-head release screw (13) the press can be filled by way of the intake hose. Tilting the press frame allows any air bubbles to escape from the two cylinders (2, 6) and from the connecting duct (12). Draw the two pistons (3, 7) upward about 3 cm. Tighten the

11 - Pressure piston valve

12 - Connecting duct

13 - Release screw

14 - Intake hose

15 - Vat including drain connector

16 - Pressure plate

17 - Cutting die

18 - Support

19 - Iron nail

20 - Styrofoam ball

knurled-head screw (13) and place the press frame onto the vat (15). Using the handle (5), push the pressure piston downward, causing the press piston (7) to rise. After opening the knurled-head screw (13), the press piston can be pushed downward once again. The hydraulic press is read to work. In the event that the pressure piston is too hard to move or that there is too little pressure in the cylinder, the pressure can be adjusted. This is done by opening the pressure piston sealing cap and removing the main piston from the press frame. (Caution: do not lose the ball valves!). The pressure applied to the o-ring seal can be varied by turning the piston plate. Usually only minor adjustment is necessary. Place the piston back into the cylinder and fasten the sealing cap.

Theoretical principles:

The hydraulic press works on the principle of the omnidirectional spread of pressure in fluids. The following rule applies: $\text{Force} = \text{Pressure} \times \text{Surface Area}$. Surface area of the pressure piston: 2 cm^2 ; surface area of the press piston: 24.6 cm^2 . The ratio of the surface areas of the two pistons is about 1 : 12. The force is amplified proportionally. For example, if a force of 10 N is exerted upon the pressure piston, a pressure of 500 hPa is caused in the fluid. This in turn causes the press piston to exert a force of 123 N. The „press force“ exerted by this model can be as much as 500 N!

Experiments

Once the basic way this model functions has been shown, realistic applications of the principles involved can then be demonstrated.

- Deforming a Styrofoam ball

A styrofoam ball is placed on the press piston plate and then compressed by moving the pressure piston up and down against the pressure plate several times. The degree to which the ball can be deformed is remarkable. It is recommended that a short experiment be done beforehand to demonstrate how much force must be exerted to deform the ball by hand!

-Cracking Nuts

In the place of the styrofoam ball, a walnut, for example, can be used.

- Bending an iron nail

For this experiment the cutting die (17) is screwed into the threaded socket on the underside of the pressure plate. Then bring the press piston plate into its lowest position. Put the support (18) onto the press piston plate. Place an iron nail across the edges of the support at a right angle to the long edge of the cutting die. By moving the pressure piston up and down several times, the press piston plate is forced against the cutting die and the nail bent.

Caution: This device may only be operated by qualified personnel or by persons they got instructions in its use.