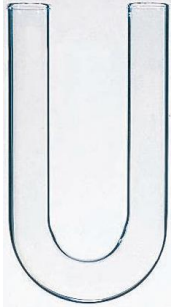


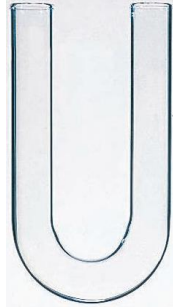
PRESSURE GAUGES: TWO LIQUID U-TUBE

- Pressure Gauges use height differences to calculate pressure $\rightarrow P_{\text{BOT}} = P_{\text{TOP}} + \rho gh$

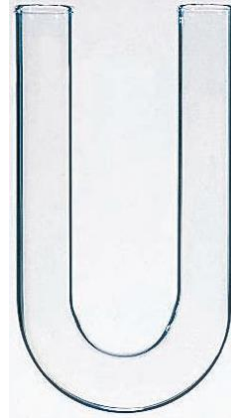
(1) 1 liquid, 2 open:



(2) 1 liquid, 1 vacuum:



(3) Most common: 2 liquids, 2 sides open:



EXAMPLE: A U-tube (as above) has two long sides, both open at their ends. You first pour enough water so that the height of the water columns on both sides is 20 cm. You then pour enough of a particular oil (800 kg/m^3) on the right side so the column of oil above the water is 5 cm tall. Assuming the liquids don't mix:

(a) What is the gauge pressure at the water-oil interface?

(b) What is the difference in height (in cm) between top of water on the left, and the top of oil on the right?

PRACTICE: U-SHAPED TUBE / FIND DENSITY

PRACTICE: Water and oil are poured into a u-shape tube, as shown below. The column of oil, on the right side, is 25 cm tall, and the distance between the top of the two columns is 9 cm. Calculate the density of the oil.

