



TANKER AIR CONSUMPTION FOR PNEUMATIC ACTUATED EQUIPMENT

Equipment: Liquip AVV3 vapor vent
Liquip SLV5 footvalve

(Both use 3095 diaphragm actuator. Diaphragm movement is 0.1 litres per actuator per actuation)

Assume: 6 compartment tanker

Pneumatic Equipment:

Fit extra reservoir, Liquip part number 2241, 13 litres capacity.

Fit brake system protection valve (hold-back valve). Liquip part No. 2240 set at 400 kPa.

Fit brake interlock Liquip part No. 2238 set to actuate at 300 – 350 kPa.

Assumptions: Brake system charges to 850 kPa (gauge), 950 kPa absolute.

The system should be regulated to a pressure of 600 kPa to the actuators but as a worst case, we will assume the regulator has not been set.

The auxiliary reservoir will not be operated at pressures less than 400 kPa gauge (500 kPa absolute), to ensure the brake interlock valve remains operational.

Calculation: At lower limit of operation we have 13 litres of air charged at 500kPa absolute

$$\text{Put } P_1 = 500$$

$$V_1 = 13.0$$

Equivalent volume at start of operation, V_2 , is at 950 kPa absolute.

$$\text{Therefore } V_2 = \frac{500 \times 13}{950} = 6.8 \text{ litres}$$

Therefore we have used (13 – 6.8) litres of compressed air in using the reservoir from 850 kPa(g) to 400 kPa(g) i.e 6.2 litres

Each complete 6 compartment tanker operation requires 6 x 2 x 0.1 litres of compressed air, i.e 1.2 litres

Therefore this size reservoir will give $\frac{6.2}{1.2} = 5$ complete tanker operations of open and close all compartments before running out of air.