ICATT APPRENTICESHIP PROGRAM TRAIN.RETAIN.GROW.	Information
Date:	Calculation of air consumption - pneumatics

A double acting cylinder is to be extended with an operating pressure of 8 bar. The piston stroke is 80mm, the piston diameter is 40mm, the number of strokes/min is 90.
The atmospheric pressure is 1 bar.

A) Calculate the air consumption in L/min

ICATT APPRENTICESHIP PROGRAM TRAIN.RETAIN.GROW.	Information
Date:	Calculation of piston force and piston speed - pneumatics

Given:

Double acting cylinder

Ø of piston, d = 40mm

length of piston stroke, s = 80 mm

# of strokes/min, n = 90

Operating pressure, pe = 8 bar

Atmospheric pressure, pa = 1 bar

TB page 428

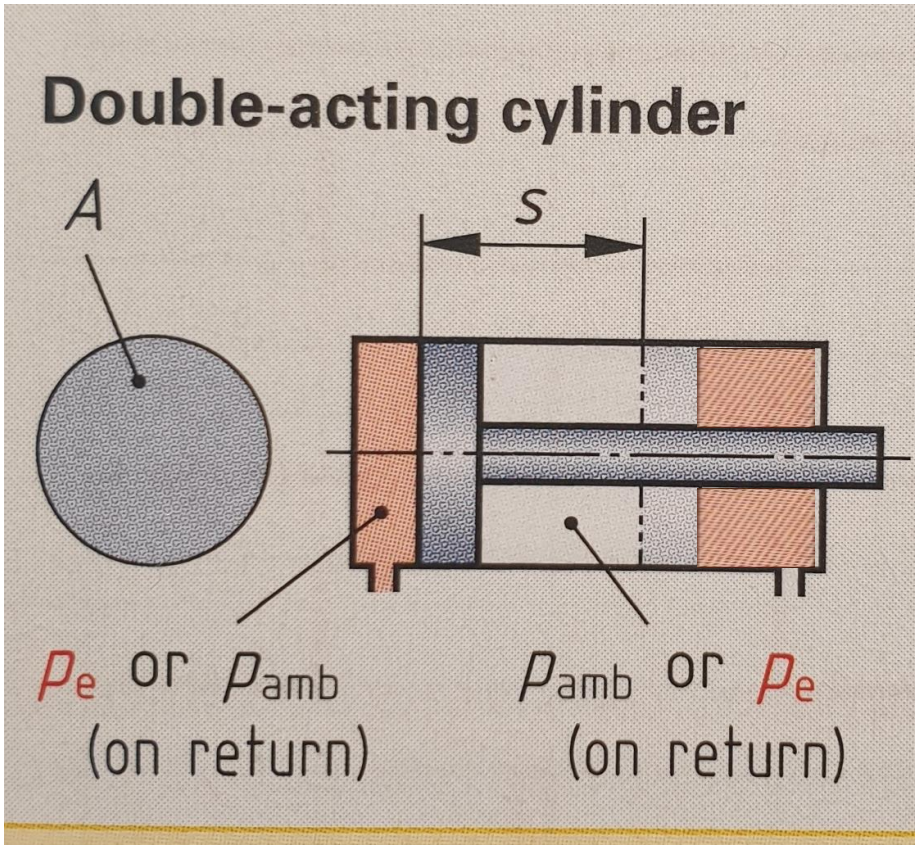
A)

ISO:

Air consumption Q in L/min, calculated

ICATT APPRENTICESHIP PROGRAM TRAIN.RETAIN.GROW.	Information
Date:	Calculation of piston force and piston speed - pneumatics

$Q \approx 2 * A * s * n * ((pe + pa) / pa)$



Note
1 bar = 10 N/cm²
= 0,1 N/mm²

Q $\approx 2 * ((d^2 * \pi) / 4) * s * n * ((pe + pa) / pa)$

$\approx 2 * ((40^2 mm * \pi) / 4) * 80mm * 90\ min^{-1} * ((8\ bar + 1\ bar) / 1\ bar)$

$\approx 2 * ((40^2 mm * \pi) / 4) * 80mm * 90\ min^{-1} * ((0{,}8\ N/mm^2 + 0{,}1\ N/mm^2) / 0{,}1\ N/mm^2)$

$\approx 162.860.163{,}162 mm^3/min = 162.860{,}163 cm^3/min = 163 dm^3/min$

≈ 163l/min