

This Issue



Illustration: John Stepan

Problem: Pneumatic Actuator Flow Rate Requirements

A pneumatic circuit has a double acting pneumatic cylinder with a 2-inch diameter piston and 12-inch stroke that reciprocates at 200-cycles/minute using 100-psig of air. What is the SCFM flow rate of air to the cylinder? Please ignore the piston rod cross-sectional area and assume the temperature remains constant.

The teaser is posted on the IFPS website (www.ifps.org) and also printed in the Fluid Power Journal. The deadline to submit an answer is the 15th of the month following release of the Journal. Anyone who submits the correct answer before the deadline date will have his/her name printed in the Society Page newsletter and in Fluid Power Journal. The winner will also be entered into a drawing for a special gift.

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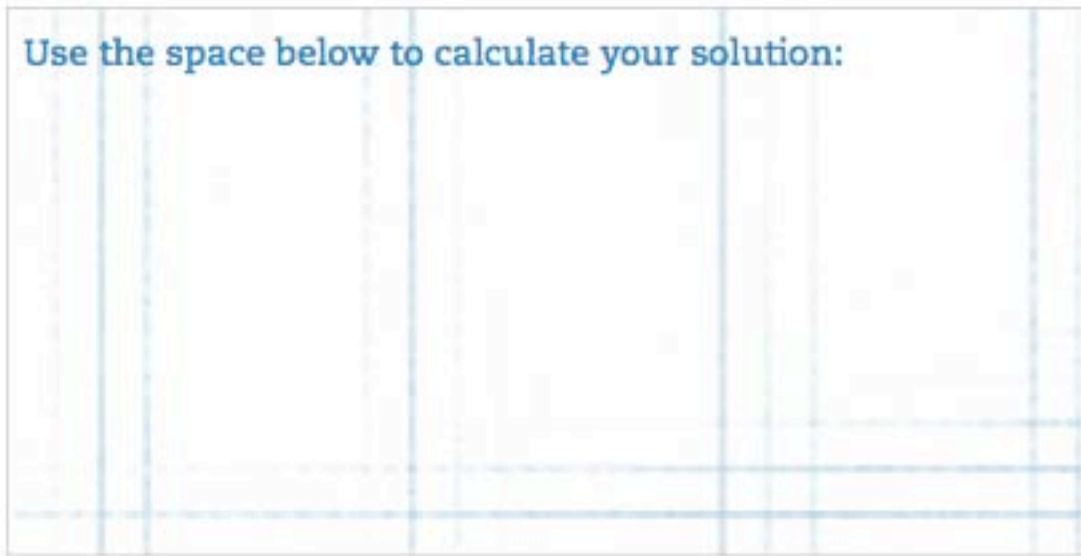


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Use the space below to calculate your solution:



Previous Solution: Conductors

$D = \sqrt{4 \times Q / \pi \times v} = \sqrt{4 \times 20 / 449 \text{ ft}^3/\text{sec} / \pi \times 20 \text{ ft}/\text{sec}} = 0.0533\text{-ft} = 0.639\text{-inches}$
Therefore the smallest acceptable tube size based of flow rate requirements is
-OD with 0.049-in wall thickness 0.652-in ID

SAE material 1010

$BP = 2ts \ d1 = 2 \times 0.049 \times 55,000 / 0.652 = 8267\text{-psi}$

$WP = 8267 / 8 = 1030\text{-psi}$

Therefore working pressure is adequate since it is greater than 1000-psi

-OD with 0.049-in wall thickness 0.652-in ID

AISI material 4130

$BP = 2 \times 0.049 \times 75,000\text{-psi} / 0.652 = 11,270\text{-psi}$

$WP = 11,270 / 8 = 1410\text{-psi}$

Therefore working pressure is adequate since it is greater than 1000-psi

-OD with 0.049-in wall thickness 0.652-in ID

Last Issue Winners:

Winner: \$40.00
IFPS Store Credit

John Jurkiewicz

CFPHS
Sentinel Fluid Controls
Toledo, OH

Answered Correctly:

Ernie Parker

CFRA, CFPMM, CFPMT, CFPSS,
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