

Fan Laws, Variations, and Related Formulas

Fan Speed (RPM)	Motor Pulley Diameter (PD)	Static Pressure (SP)	Amperage (AMP)
$RPM_2 = RPM_1 \times \left(\frac{CFM_2}{CFM_1} \right)$	$PD_2 = PD_1 \times \left(\frac{CFM_2}{CFM_1} \right)$	$SP_2 = SP_1 \times \left(\frac{CFM_2}{CFM_1} \right)^2$	$AMP_2 = AMP_1 \times \left(\frac{CFM_2}{CFM_1} \right)^3$
$CFM_2 = CFM_1 \times \left(\frac{RPM_2}{RPM_1} \right)$	$CFM_2 = CFM_1 \times \left(\frac{PD_2}{PD_1} \right)$	$CFM_2 = CFM_1 \times \sqrt{\frac{SP_2}{SP_1}}$	$CFM_2 = CFM_1 \times \sqrt[3]{\frac{AMP_2}{AMP_1}}$
-----	$PD_2 = PD_1 \times \left(\frac{RPM_2}{RPM_1} \right)$	$SP_2 = SP_1 \times \left(\frac{RPM_2}{RPM_1} \right)^2$	$AMP_2 = AMP_1 \times \left(\frac{RPM_2}{RPM_1} \right)^3$
$RPM_2 = RPM_1 \times \left(\frac{PD_2}{PD_1} \right)$	-----	$SP_2 = SP_1 \times \left(\frac{PD_2}{PD_1} \right)^2$	$AMP_2 = AMP_1 \times \left(\frac{PD_2}{PD_1} \right)^3$
$RPM_2 = RPM_1 \times \sqrt{\frac{SP_2}{SP_1}}$	$PD_2 = PD_1 \times \sqrt{\frac{SP_2}{SP_1}}$	-----	$AMP_2 = AMP_1 \times \sqrt{\frac{SP_2}{SP_1}}$
$RPM_2 = RPM_1 \times \sqrt[3]{\frac{AMP_2}{AMP_1}}$	$PD_2 = PD_1 \times \sqrt[3]{\frac{AMP_2}{AMP_1}}$	$SP_2 = SP_1 \times \sqrt[3]{\frac{AMP_2}{AMP_1}}$	-----

To Calculate Size of a Driven Pulley

$$PD_2 = PD_1 \times \left(\frac{CFM_2}{CFM_1} \right)$$

Fan Tip Speed

$$Tip\ Speed = \frac{Fan\ Wheel\ Diameter\ " \times RPM \times 3.14}{12"}$$

Brake Horsepower

$$BHP\ (1\phi) = \frac{V \times A \times 0.85 \times 0.80}{746}$$

$$BHP\ (3\phi) = \frac{V \times A \times 0.85 \times 0.80 \times 1.73}{746}$$

New Belt Size

$$Belt\ Length = 2C + [1.57 \times (D_1 + D_2)] + 1$$