

AIR COMPRESSOR SIZING GUIDE

1. Know the Four Key Specs

CFM	Airflow delivered. This is the primary sizing number: your compressor must supply enough CFM for the tools operating at the same time.
PSI	Air pressure. Many shop air tools operate around 90 PSI, while some tire-service equipment may require roughly 125-150 PSI.
Horsepower	Indicates motor power, but equal-HP compressors can produce different airflow. Compare rated CFM rather than sizing by HP alone.
Tank Size	Stored-air reserve. A larger tank reduces cycling during short bursts, but it does not increase the compressor's CFM output.

2. Calculate Required Airflow

Step 1: List every air tool that may run at the same time.

Step 2: Add their CFM requirements at the required working pressure.

Step 3: Add operating headroom. As a practical starting point, multiply simultaneous CFM by about **1.25 for a two-stage compressor** or **1.5 for a single-stage compressor**. For demanding continuous use, additional capacity may be appropriate.

Example: if simultaneous tools require 15 CFM, a two-stage starting target is about 18.75 CFM (15 x 1.25).

3. Quick Application Guide

Application	Typical starting point
Home / DIY	1-2 HP; 6-30 gal; single-stage; intermittent use
Automotive shop	5-7.5 HP; 60-80 gal; two-stage
Body / paint shop	High-CFM two-stage; 80-120 gal; size for continuous-use sanders/spray guns
Jobsite / framing	Portable twin-stack or wheelbarrow style; engine-driven only where appropriate outdoors
Industrial / continuous	Rotary screw; size to peak simultaneous CFM

4. Match Compressor Type to Duty Cycle

Single-stage	Best for lighter or intermittent use. Often around 125-135 PSI maximum and generally has a lower duty cycle.
Two-stage	Better suited to busy shops and extended tool use. Commonly reaches about 175 PSI and supports a higher duty cycle.
Rotary screw	Designed for sustained, high-demand applications where compressed air is needed continuously.

5. Avoid These Common Sizing Mistakes

- Choosing by horsepower or tank gallons instead of rated CFM.
- Meeting the CFM requirement but not the highest PSI requirement.
- Sizing for only one tool when multiple tools may operate together.
- Assuming a larger tank can compensate for an undersized pump.
- Ignoring duty cycle and leaving too little capacity for sustained use.

Useful rule of thumb: automotive shops may start around 4-5 CFM per person; body shops with sanders and spray equipment may need roughly 12-15 CFM per person. Always verify the actual requirements of your specific tools.

General sizing reference only. Tool air consumption varies by model, condition, usage pattern, pressure, and installation. Confirm equipment specifications and available electrical service before selecting a compressor.

6. CFM Consumption Table

Tool / Equipment	Required PSI	Air Consumed (CFM)
Impact Wrench 3/8-1/2	70-90	5
Impact Wrench 1/2-3/4	70-90	10
Impact Wrench 3/4-1 3/4	70-90	20
Air Ratchet	70-90	3-5
Body Sander (Orbital)	70-90	12
Tire Changer	125-150	2
Bead Breaker	125-150	12
Blow Gun	70-90	3
Die Grinder	70-90	7
Screwdriver #2-6 Screw	70-90	5
Screwdriver #6-5/16 Screw	70-90	10
Paint Spray Gun (Touch Up)	70-90	4
Paint Spray Gun (HVLP)	40-60	15
Nailers / Staplers	70-90	2-4

Important: Tire changers and bead breakers require 125-150 PSI, so confirm pressure capability as well as CFM. High-consumption tools such as orbital sanders (12 CFM) and HVLP spray guns (15 CFM) can account for most of a compressor's capacity by themselves.