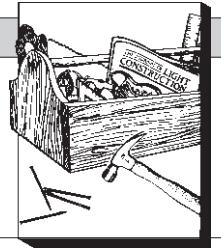


Lightweight Air Compressors

by Clayton DeKorne



I discovered the benefits of a small compressor by accident when we were forced to rent one. We asked the rental company for the least expensive compressor that would handle a small commercial finish job. This turned out to be a 3/4-hp Rol-Air with a single 2 1/2-gallon tank. We also got 100 feet of hose so we could leave the compressor outside to make our presence in an occupied office as unobtrusive as possible.

As it turned out, the hose leaked and we didn't have the time to trek back across town to the rental house. So we made do with a 20-foot hose but we were practically standing on top of the compressor. Surprisingly, however, this little compressor was very quiet, especially compared with the scream of the 1 1/2-hp unit we were used to. The little Rol-Air was also extremely maneuverable in the crowded office and we didn't have to search out a 20-amp breaker to power it.

This experience prompted me to investigate other small compressors. I looked at three lightweight compressors made by Rol-Air (Associate Engineering Corp., 606 S. Lake St., Hustisford, WI 53034; 414/349-3281), Thomas Industries (Power Air Division, P.O. Box 29, Sheboygan, WI 53082-0029; 800/558-7721), and Emglo Products (303 Industrial Park Road, Johnstown, PA 15904; 814/266-8656). They all seem well-suited to running a finish nailer. And, in a pinch, they can run a framer, too. The biggest differences between these compressors lie in the tank configurations and in little extras such as regulators and gauges.

Size and Shape

Thomas Industries is the originator of the "pancake" type portable compressor (model T-30A). This has a round tank on which the motor and pump sit; it is bottom-heavy and stable. The top-carry handle is made of a nylon plastic that flexes when you pick it up. Thomas also makes a unit with two horizontal tanks that ride like pontoons on each side of the pump and motor (model T-30WT).

Both these units have "oil-less" motors. These motors probably won't last as long as the "splash oil" motors on the Rol-Air and Emglo units. But Thomas provides a rebuild kit with new gaskets, valves, and a piston. I was able to complete the rebuild in about 30 minutes.

Rol-Air produces three different 3/4-hp compressors. They all have the same motor and pump. In addition to the 2 1/2-gallon unit (model DO75HS3) that I rented, Rol-Air also makes a 4 1/2-gallon pancake compressor (model DO75HP5) and a 4 1/2-gallon "vertical pancake" unit (model DO75HPV5). The 2 1/2-gallon model is easy to carry, but it is top heavy and tips over easily. It has to be laid on its side when transported in a vehicle. The "pancake" version is similar to the Thomas. It's stable but it's not as compact as the "vertical pancake" model. The roll cage on the vertical

model protects the regulator and quick connect well, but makes it too cramped for a water filter. The vertical pancake has one handle and is a bit awkward to carry. I found it balances best if you carry it at your side with the tank facing back.

The Emglo 3/4-hp "Air-Mates" have exactly the same pump and motor as the Rol-Air (made by the same foreign manufacturer). They come in two models: one with two pontoon tanks (model AM39-HC4) and one with two stacked tanks (model AM39-HCV4). These units are considerably heavier—57 pounds—because of the extra amount of steel with two tanks (compare 50 pounds for the Thomas and 47 pounds for the Rol-Air). Nevertheless, the Emglo HCV4 carries well like a briefcase yet is stable. Both these Emglo models have a smaller tank capacity that slightly affects their performance.

Both the Rol-Air and Emglo units come with a regulator with a line gauge and a tank gauge as standard equipment. There's no outlet for a tank gauge on the Thomas and the regulator and line gauge are "optional," which means you pay extra for them. Rol-Air is the only one that provides a quick connect as a part of the package. The Thomas unit costs about \$365 but the price varies depending on who markets it. Both Stanley-Bostitch and Senco sell variations of this compressor under their own labels and model numbers. The Rol-Air can be bought for \$219 and the Emglo for about \$275 from mail-order houses.

Performance

All compressor manufacturers provide mysterious data for their compressors. These figures are usually given in two ways: as "air displacement" and as "air delivery." Air displacement (also called "cubic feet displaced") is a theoretical value for the performance of the compressor in a perfect world without friction, strain, and heat build-up. This figure can be ignored. Air delivery (also called "performance cfm of free air" and "actual delivery") describes the amount of usable air that a compressor can produce to run a certain tool.

Air delivery numbers are always given at several psi levels because it is harder for a pump to compress air into a tank that is already pressurized than it is into an empty tank. The air delivery values can give you a pretty good idea of how any compressor will perform if you know how much air your nail gun uses.

I did all my testing with a Senco SFN2B finish nailer and a Senco SN-4 framer. The finish gun uses .05505 cfm per nail. The framer uses .14131 cfm per nail. I divided the air delivery specified for the compressor (at 100 psi since this is the recommended pressure for running these nailers) by the amount of air used per nail to see how many shots I could hope to pull off in a minute. This can be done with any compres-

sor to estimate if it will handle your requirements.
Both Emglo and Rol-Air cite 2.6 cfm at 100 psi. So:

$$2.6 \div .05505 = 47.2$$

The Thomas claims 1.95 cfm at 100 psi. so:

$$1.95 \div .05505 = 35.4$$

Since I rarely shoot a finish gun at either 47 or 35 shots per minute on a finish job, it seems that all these compressors would be good for running a finish gun (or maybe two).

But using a framer is a different story. It's not uncommon to zip off a whole strip of 40 or 60 nails in less than a minute when putting together laminated plywood and lumber beams or nailing down a subfloor. So:

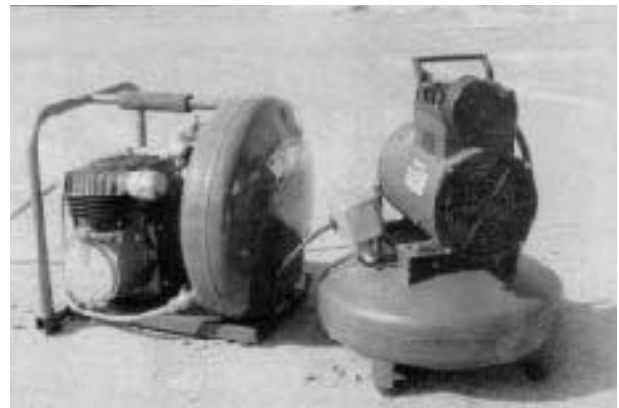
$$2.6 \div .14131 = 18.4$$

And:

$$1.95 \div .14131 = 13.8$$

This seems to say that I can only pull off one shot every three or four seconds. For framing work, it would be better to use a bigger compressor.

I also tested these compressors in the field. The results were a bit better than the estimates. In fact, I was able to bang off almost 60 framing nails in



about a minute with the Rol-Air.

This is because the air delivery rates give the usable cfm that the compressor can produce. But two other factors are working in our favor. First, the reserve air in the tank is also available for use. And second, the tank pressure is higher than the line pressure that is set to run a nailer (usually 100 psi), so there is additional air pressure in the system to sustain the gun while it is in use. Thus, the tank size and the pressure switch setting on any compressor are important.

The Rol-Air and the Thomas I tested have 4 1/2-gallon tanks. The Emglo has a total of 3.8 gallons of reserve air in its twin tanks. The tank pressure on the Rol-Air and the Emglo is set at 135 psi. On the Thomas, the pressure is set at 125 psi. What this all adds up to in actual use is that the Rol-Air can bang out a strip of framing nails but the other two compressors cause the "stair-step effect" (when nails don't set all the way) after about nail 55. With the Emglo this is caused by the smaller tank size and with the Thomas it is due to the lower pressure setting. Still, all three are in the same ballpark: great for finish work and usable for occasional framing if you don't mind going slow. Anything more than occasional framing will overwork the compressor. ■