Tri-Max² Extreme Duty
Industrial-Grade Air Compressor

The Facts

HORSEPOWER (HP) / TRUE OR EXAGERATED?

Many air compressor companies “exaggerate” their horsepower ratings to help big retail chain stores sell more compressors. Industrial compressors like our TRI-MAX™ Series are accurately rated, which is why our 5 and 7.5 HP motors are physically larger (almost 40% larger) than an overrated big retail chain store one. A good way to tell if you are looking at real or overrated HP is to look at how much electrical power it takes to run the motor. Good rules of thumb for TRUE horsepower ratings are as follows.

1-Phase 115V - 9½ -10 Amps per HP
1-Phase 230V – 4½ - 5 Amps per HP
3-Phase 230V – 2 - 2½ Amps per HP
3-Phase 460V – 1-1¼ Amps per HP

A true 5 HP motor will draw 22-25 amps and be required to run on a 220 volt circuit, (single phase power), whereas many big retail chain store compressors run on a normal 15 amp 110 volt circuit. A normal 15 amp 110 volt circuit is really only capable of running about 2-3 real HP. If you can plug it into a normal wall plug, it really can’t be more than 2-3 true HP.

BALDOR MOTORS ARE BEST

BendPak offers you the piece of mind that comes with buying the best. Our TRI-MAX™ Series air compressors feature the best electric motor money can buy. For the past eight decades, Baldor Electric has led the industry in developing electric motors that deliver greater performance and reliability while using less electricity. High performance and reliability are the hallmarks of these energy efficient electric motors. Premium-grade copper wire, more iron, thinner laminations, premium-grade steel, superior bearings, larger end rings and low-loss fans let these energy efficient motors run cooler and longer with better dependability. Their formula, like ours, is simple - quality products, and exceptional after sales support.

In October of 2006, Baldor again received 1st place ranking for motors in several trade publication surveys. Baldor continues to rank better than any other motor manufacturer in their category. The results of each survey are listed below. The question asked by each magazine to their readers was "who do you consider to be the top industrial electric motor manufacturer?" or "if you could only choose one motor manufacturer, who would it be?” No matter how you word it, what it comes down to is customers prefer Baldor.

Control Design Readers Choice	***Food Engineering Magazine Readers Choice***	***IMPO - Industrial Maintenance & Plant Ops Readers Choice***
Industrial Electric Motors	Industrial Electric Motors	Industrial Electric Motors
1. Baldor 48%	1. Baldor 71%	1. Baldor 64%
2. Regal-Beloit 17%	2. GE 30%	2. GE 23%
3. Rockwell (Reliance) 12%	3. Reliance 30%	3. Reliance 19%
4. GE 5%	4. Leeson 21%	4. USEM 11%

100% CAST IRON CONSTRUCTION

A true industrial-grade air compressor like our TRI-MAX™ Series models feature a 100% cast iron construction on the pump, block and heads. That is the biggest selling advantage our TRI-MAX™ Series models have over our competition. An air compressor pump is just like a car engine and as you know, almost all car engines are made from cast iron. Cast iron is the most durable material that can be utilized on a high-use, high-temperature applications. Engines used for racecars may use aluminum for weight reduction but these engines last for one or two races then have to be rebuilt.

MOISTURE

When compressed air gets hot then cools, it creates condensation. The harder you work your compressor the hotter it will get and the more moisture problems you will have. There are two moisture problems that exist. The first is moisture that goes through the air lines then eventually to your air tools, the second is air that accumulates in the bottom of the tank which can cause excessive rust and jeopardize the integrity of your tank. The trick is to keep the air as cool as possible. Copper pipe works best because it dissipates heat and will not rust. Our TRI-MAX™ power-house air compressors feature the renowned TRI-MAX™ extreme-duty three-cylinder pump that has been designed and manufactured to operate with maximum cooling efficiency under all load conditions. The 100% cast-iron TRI-MAX™ Series pump features a "W-3" configuration that provides 360° cooling efficiency and simple splash lubrication for total reliability. A multi-blade cooling fan helps to provide maximum forced air-cooling for ultimate efficiency. A large pump that puts out little noise and a lot of power is due to the slower RPM speed and efficient two-stage design, a special feature of every TRI-MAX™ Series pump. Because they operate at slower speeds than other compressors and feature large-diameter finned copper tubing between stages, they have a lower operating temperature, which ultimately achieves maximum compressor efficiency.

CUBIC FEET PER MINUTE (CFM)

Air tools and equipment require a certain volume of air to keep them going. The volume of air that a compressor produces is rated in CFM (Cubic Feet per Minute). You may see several CFM ratings at different pressures on a compressor. CFM ratings tend to be exaggerated just like HP ratings, but you should get around 3½ - 4 CFM per real HP at 90 PSI.

TANK SIZE

Does size matter? The answer is "not too much." A compressor tank doesn't produce air, it only stores air. It is much more important to have a big enough pump and motor, because if you are producing as much air as you want to use, you'll never run out of air no matter how small the tank is. A smaller tank is more portable and gets up to pressure quicker, whereas a compressor with a large tank doesn't start and stop as often and cools the air a bit better. A large tank doesn't mean the compressor runs less, it starts and stops less often but the running time is the same as if it had a smaller tank.

CERTIFIED TANK MEETS ASME STANDARDS

All TRI-MAX™ extreme-duty compressors feature 80-gallon tanks manufactured by Manchester Tank, the world's premier manufacturer of pressure vessels. Founded in 1946, Manchester Tank produces quality pressure vessels in North America and Australia. Manchester Tank continues to set the standard for quality and reliability, and provide unsurpassed value in both mass-market and customized D.O.T. and A.S.M.E. products.

ONE OR TWO STAGE

Single stage compressors have one or more cylinders and each cylinder pumps air directly into the tank. Two stage compressors have at least 2 cylinders where air is pumped from one cylinder into another and then into the tank. A typical two stage, 2 cylinder compressor has a large first stage cylinder which pumps air through a cooling tube and into the smaller second stage cylinder at about 90 PSI, and finally into the tank at 175 PSI. The main reason for buying a two-stage air compressor is if you need high pressure. **Two-Stage:**
A two-stage model pump compresses air to an intermediate pressure chamber in the first stage, removes heat of compression through an intercooler, and compresses air to a final pressure in a second compression stage. Two-stage compressors are more efficient and are generally used for higher pressures.

Benefits of the BendPak Tri-Max Series Two-Stage Design;

- Removable cast-iron cylinders are easy to repair, provide even 360-degree cooling and eliminate hot spots.
- Durable cast-iron cylinders, heads and pump block help extend pump life.
- Overhung crankshaft is precision-balanced to run smoothly and quietly.
- Finned copper intercooler runs cool in even the most demanding conditions.
- Splash lubrication is simple, reliable, and does not require an oil pump, making it inexpensive and easy to maintain.

PRESSURE CONTROL

The pressure switch automatically maintains the set pressure at the control discharge by wiring the pressure through the motor starter coil to control the compressor motor. A drop in system pressure closes the pressure switch starts the air compressor. When the pressure switch is satisfied, the compressor will stop and the unloader valve will exhaust the air between the compressor and check valve. This allows the compressor to begin its next cycle without any head pressure. The pressure gauge allows the installer to see the start / stop pressure settings and to adjust if necessary. In the event of a closed air line or excessive pressure build up in the compressor discharge, the safety valve in the line will protect the compressor.

OIL OR OIL-LESS

Most industrial grade compressors are splash lubricated which means they have "flaps" on the bottom of the connecting rods to splash oil around in the compressor crankcase. As long as there is enough oil in the crankcase, splash lubricated pumps should last a long time. Many cheaper direct-drive compressors are oil-less, which means they use no oil to lubricate the piston inside the cylinder. If you can imagine your car engine running without oil you can understand the problem. Oil-less compressors usually use cheaper aluminum cylinders, heads and pistons to help dissipate the heat. It may help dissipate the heat, but aluminum warps and wears out much faster than cast-iron. Another advantage oil-lubricated compressors have over non-lubricated ones are they are much quieter. Oil-less air compressors are very noisy because they have no oil in the pump to "muffle" the sounds of the moving parts.

DIRECT DRIVE OR BELT DRIVE

The main advantage of belt-drive compressors is that the pump can spin a lot slower than the motor, which allows it to be more efficient with a lot less wear and tear. Pumps on direct-drive compressors turn at a much faster RPM because the pump is connected directly to the motor shaft and turns the same speed as the motor. Most electrical motors spin at either 2850 or 3450 RPM. Our TRI-MAX™ Series models use a belt-drive allowing the pump to run at a lower RPM than the motor and the lower the RPM, the better. The motor RPM is always the same and cannot be changed. An air compressor RPM rating is the rating for the pump not the motor. But pump RPM and CFM is also relative to pump size and output. You can have two 7.5 HP air compressors running at the same 900 RPM but one may obtain a higher CFM than the other because of piston size. Obviously a larger piston moving at the same RPM as a smaller one will produce a higher CFM. “Big Chain Store” air compressors usually are higher RPM because their pumps are usually much smaller than an industrial brand. Remember, higher RPM causes more heat than slower RPM.

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AIR REQUIREMENT FOR OPERATING VARIOUS AIR TOOLS AND EQUIPMENT

Tool/Equipment	Size or Type	Est. (PSI) Req.	Est. (CFM) Req.
Air Bushing	Small or Large	80-90	15-25
Air Hammer	Light to Heavy	70-90	4.0-40
Blow Gun		70-90	3
Body Polisher		70-100	2
Body Sander	Orbital	70-100	5
Die Grinder		70-100	7
Drill		70-90	50-110
Dusting Blow Gun		70-90	5
Grease Gun		70-90	3
Grease Gun	Hi Pressure	120-150	4
Grinders - Horizontal	6" to 8" wheel	70-90	50
Grinders - Horizontal	2"-2 1/2" wheels	70-90	14-20
Grinders - Horizontal	1-1/2" wheels and under	70-90	10
Grinders and Sanders - Vertical	Large	70-90	53
Grinders and Sanders - Vertical	Medium	70-90	30
Grinders and Sanders - Vertical	Small	70-90	22
Hydraulic Floor Jack		125-150	6
Hydraulic Lift		145-175	6
Impact Wrench/ Screw Driver	Small to Large	70-90	4-10.0
Impact Wrenches	Up to-1/2"	70-90	5
Impact Wrenches	1/2" to 3/4"	70-90	10

Impact Wrenches	3/4" to 1 1/4"	70-90	20
Impact Wrenches	1-1/4" to 2"	70-90	30
Nailers and Staplers		70-100	5.0-8.0
Paint Sprayers	Protection gun	40-70	20
Paint Sprayers	Small Hand	70-90	2.0-7.0
Riveters	Small-Large	70-90	10.0-40
Riveters	3/32"-1" rivets	70-90	12
Riveting Hammer		70-100	8
Rotary Sanders		70-90	30
Scaling Hammer		70-100	3
Screwdrivers	Nbr. 2 to 6 screw	70-90	5
Screwdrivers	Nbr. 6 to 5/16" screw	70-90	10
Spark Plug Cleaner	Reach 36-45	70-90	5
Spray Gun Engine Cleaner		90-100	5
Tire Changer		70-90	1
Tire Changer		125-150	2
Tire Hammer		90-100	12
Tire Inflater		70-90	2
Tire Rim Stripper		125-150	6
Tire Spreader		70-90	1
Touch Up Paint Spray Gun		90-100	4
Undercoat Paint Spray Gun		90-100	19
Vacuum Cleaner Shop		100-120	6
Valve Grinder		70-90	2
Vertical Disc Sander		90-100	10

HOW MUCH DO AIR LEAKS COST?

Leakage Loss	Air Loss	Air Loss	Loss / Day	Loss / Month	Loss / Year
Orifice Dia. (In.)	CFM	cu. ft./day	$	$	$
1/64	0.4	590	0.15	4.4	54.75
1/32	1.6	2332	0.58	17.6	211.7
3/64	3.7	5270	1.32	40.15	481.8
1/16	6.5	9345	2.34	71.17	854.1
3/32	14.5	20880	5.22	158.77	1905.3
1/8	26	37152	9.29	282.57	3390.85
3/16	58.3	83952	20.99	638.45	7661.35
1/4	104	149760	37.44	1138.8	13665.6
5/16	162	233280	58.32	1773.9	21286.8
3/8	234	336960	84.24	2562.3	30747.6
1/2	415	597600	149.4	4544.25	54531
5/8	649	934560	233.64	7106.55	85278.6

The above figures are based on values from the Compressed Air & Gas Handbook. Calculations assume a conservative cost of $0.25/1000 cu. ft. of compressed air, 100% coefficient of flow, and working 8,760 hours/year, at 100 psig.