The art of choosing the right compressor

KW verses CFM Explained

Choosing a compressor solely based on **kilowatt** could negatively impact overall operating expenses

Initial cost versus overall cost

When considering an air compressor, a primary concern should be; **"How can I get the most amount of compressed air for the lowest overall cost?"** Inexperienced consumers may consider only a small fraction of the life-cycle cost -- the initial cost of the machine, not realizing they will likely spend more in electricity the first year to run the machine than the purchasing price. That's why, when comparing compressors, it's important you examine all aspects of the costs associated.

Compressor size based on cubic feet per minute not kilowatt

The first step in choosing the proper compressor is finding the actual CFM demand your plant requires. CFM (Cubic Feet per Minute) describes the volume flow rate of compressed air. Improperly sizing your compressor can cost lacs of rupees in wasted electricity if you select an oversized compressor.
On the other hand, if you had more demand than you originally thought, the new compressor that you just purchased may be insufficient. Accurately determining your CFM demands is a critical first step in selecting an air compressor. Engineers work hard to improve the efficiency of air compressors and the design to produce more air than previous generations. If you are replacing an existing compressor, check your CFM rating and choose a new compressor with the same CFM rating.

Do not **automatically** swap out a compressor for another one with the same **kilowatt** rating; a newer model is likely able to produce more CFM while using less **KW**. A compressor with a smaller **KW**, but equal rate of CFM, can lower your energy cost without any reduction in power/energy.

More **kilowatt** is not always better

A higher kilowatt air compressor uses more electricity than a smaller one, so the important question is **"Am I getting any more CFM for my increased cost?"** For compressors with the same advertised kilowatt, the CFM output can vary by as much as 25% between companies and models. As an educated customer, you want the right amount of CFM at your necessary pressure for the smallest energy. This will allow you to manufacture at the lowest energy consumption and generate the highest profit.

What does this mean for me?

All of this makes theoretical sense, but how do you find **which compressors are the most efficient?** Compressors vary in CFM ratings, KW ratings, and total package energy usage – a lot to research and compare. A group of air compressor manufacturers realized customer concerns and created a group called CAGI, the Compressed Air and Gas Institute. Each compressed air manufacture agreed to have their compressors independently tested and verified. Once verified, certified data sheets are published publicly on each company's' website with key information you need to make your buying decision easier. It is the air compressor version of a car's window sticker. On each CAGI sheet, the amount of CFM the compressor produces at a given pressure, the maximum pressure that can be produced, and the efficiency of the compressor in KW/100Cfm rating can be found.

How to read a CAGI data sheet

Below are CAGI data sheets from two 75 kw compressors rated for 7 bar(G) (listed in the blue boxes on lines 4 and 6). Line 3 lists the capacity of the compressor in CFM at the full load operating pressure (7 bar(G) in this case). Notice that the Atlas Copco compressor produces 47cfm (or 10%) more than the competitor. Another important measurement to consider when viewing the CAGI sheet is line 12 which shows the amount of electricity (in kW) required to create 100 CFM at the listed pressure (again 7 bar(G) in this case). This measurement is referred to as the specific power of the compressor. It is the best apples to apples comparison of the efficiency of the compressor and can be used to calculate the actual cost to run the compressor. In this case, the Atlas Copco compressor uses 1.7kw (or 10% less) energy to generate 100cfm for your plant.

COMPRESSOR DATA SHEET
Rotary Compressor: Fixed Speed

Model Data - For Compressed Air				
1	Manufacturer: Atlas Copco			
2.	Model Number: GA75+		Date:	June
	[X] Air-cooled [ ] Water-cooled [X] Oil Injected [ ] Oil-free		Type:	Screw
			#of stages:	1
3	Rated capacity at full load operating pressure[a, e]	525	acfm[a,e]	
4	Full load operating pressure[b]	7	bar(G)	
5	Maximum full flow operating pressure[c]	7.5	bar(G)	
6	Drive motor nominal rating	75	KW	
7	Drive motor nominal efficiency	94.5	percent	
8	Fan motor nominal rating (if applicable)	1.85	**kw**	
9	Fan motor nominal efficiency	76.0	percent	
10*	Total package input power at zero flow[e] (No load)	21.9	kW[e]	
11	Total package input power at rated capacity and full load operating pressure[d]	87.7	kW[d]	
12	Specific package input power at rated capacity and full load operating pressure[e]	16.7	kW/100 cfm[a]	

Model Data - For Compressed Air				
1	Manufacturer: Other			
2.	Model Number: Other		Date:	June
	[X] Air-cooled [ ] Water-cooled [X] Oil Injected [ ] Oil-free		Type:	Screw
			#of stages:	1
3	Rated capacity at full load operating pressure[a, e]	478	acfm[a,e]	
4	Full load operating pressure[b]	7	bar(G)	
5	Maximum full flow operating pressure[c]	7.5	bar(G)	
6	Drive motor nameplate rating	75	kW	
7	Drive motor nameplate nominal efficiency	95.4	percent	
8	Fan motor nameplate rating (if applicable)	2.23	**kw**	
9	Fan motor nameplate nominal efficiency	89.5	percent	
10*	Total package input power at zero flow[e] (No load)	25.6	kW[e]	
11	Total package input power at rated capacity and full load operating pressure[d]	87.8	kW[d]	
12	Specific package input power at rated capacity and full load operating pressure[e]	18.4	kW/100 cfm[a]	

* For models that are tested in the CAGI Performance Verification Program, these items are verified by the third party administrator

a. Measured at the discharge terminal point of the compressor package in accordance with ISO 1217, Annex C; ACFM is actual cubic feet per minute at inlet conditions.
b. The operating pressure at which the Capacity (Item 3) and Electrical Consumption (Item 11) were measuredMemberfor this data sheet.
c. Maximum pressure attainable at full flow, usually the unload pressure setting for load/no load control or the maximum pressure attainable before capacity control begins. May require additional power.
d. Total package input power at other than reported operating points will vary with control strategy.
e. Tolerance is specified in ISO 1217, Annex C, as shown in table below

A critical understanding

In order to make an educated purchase, it is critical to understand that all compressors are not designed equally and that depending on your requirements, you may be able to use a lesser kilowatt, more efficient compressor. Buying a lesser KW compressor that produces the same amount of CFM allows you to keep profit in your pocket.

CFM vs KW in terms of a car engine

INNOVATIVE PERFORMANCE **ADVANTAGE**

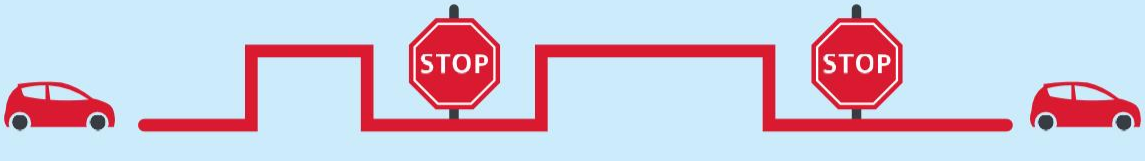
SAME SIZED ENGINE, BETTER RESULTS

48 KMS
INR 400 PER 100 KMS

56.5 KMS
INR 350 PER 100 KMS

The same kilowatt Atlas Copco compressor produces16% more cfm per kW than our competitor, putting
MORE MONEY IN YOUR BOTTOM LINE

ONCE YOU PICK THE RIGHT "ENGINE," DO YOU WANT TO CHANGE YOUR DRIVING STYLE?



FIXED SPEED DRIVE

VARIABLE SPEED DRIVE

A VSD COMPRESSOR SIMPLY ADJUSTS ITS MOTOR AND ELEMENTS SPEED TO MATCH THE DEMAND YOUR DRIVING STYLE CAN PRODUCE

SAVINGS OF up to 50%

Not sure where to start? Start by analyzing your air system's life-cycle costs. You can analyze your usage and potential cost savings by conducting a compressed air energy assessment. Best of all – it causes no harm or downtime to check.

Give us a call at 1800 120 110030 to get started.

Compressor Technique
Atlas Copco (India) Limited
Call: 1800 120 110030
Email: info.compressors@atlascopco.com
Whatsapp: +91 77680 80901
Website: https://www.atlascopco.com/en-in/compressors