

Compressed Air

This guide is to be used as a general introduction to compressed air and its uses. There are a number of terms used in the compressed air industry, below are a few of the most used and a brief explanation of what they mean.

AIR

Displacement (Volume)

This term is used to decide the theoretical volume of a compressor, ie the swept volume of a cylinder multiplied by the number of compressions in a minute and expressed in cubic feet per minute (CFM).

This figure should not be used in calculating the size of compressor needed, as it bears no relationship to the free air figure that you may require.

Free Air delivered

This measurement is the volume of air taken in to a compressor and therefore describes more accurately the volume of air available for use. Expressed as CFM/FAD at a given pressure. Remember: Displacement is the theory and CFM/FAD is the actual volume available.

Pressure

This is the way force, ie power, in the compressed air system is expressed and is measured in either pounds per square inch (psi) or bar. Pressure is important because to have too low a pressure would cause the equipment not to work correctly, too high a pressure would at best rapidly wear out the equipment, at worst it could make the equipment lethal.

See the enclosed technical information chart for the correct pressure for individual piece of equipment

Single Stage Compressors

One or more cylinders producing the final pressure in one compression. Normal maximum pressure 150 psi. g.



Two Stage Compressors

First stage, air is compressed to approximately 30 psi. g., cooled then compressed to final pressure in the second stage. Normal maximum pressure 200 psi. g.
Note: Two stage provides more air for less energy.



Quick guide to CFM/FAD output (approx) of an existing compressor

Multiply motor hp by 3.3 = output in CFM / FAD
Multiply motor kW by 4.5 = output in CFM / FAD
Multiply motor kW by 2.1 = output in L/sec / FAD



ELECTRICAL SUPPLY

Single Phase.

Standard supply for domestic and light industry 220/240 volts.

- 5 Amp light circuit
- 13 Amp ring main

Not suitable for equipment
Max 2.5 hp std compressor
Max 3.0 hp for LC compressors
Max 3.5 hp compressor
Excellent second-hand resale value



Three Phase

Main electrical supply to industry.
• 380/440 Volts

Any size of compressor

Main Benefits of Three Phase

- Approx 2/3 cost saving over single phase
- Stable supply
- Longer motor life



Compressed Air Guide

Tools

	FAD/CFM	Pressure PSI.G
3/8" Impact Wrench	2-3	70-90
1/2" Impact Wrench	4-6	70-90
3/4" Impact Wrench	9	70-90
1" Impact Wrench	14	70-90
3/8" Ratchet Wrench	2-5	70-90
1/2" Ratchet Wrench	2-5	70-90
3/8" Drill	5	70-90
1/2" Drill	12	70-90
DA Sander (top quality)	10	70-90
DA Sander (econ. model)	20	70-90
7" Sander/Polisher	25	70-90
Zip/Impact Cutter	4-5	70-90
Cutters Shears	4-8	70-90
4" Angle Grinder	18-25	70-90
7" Angle Grinder	25-35	70-90
Tyre Inflator	2-4	150-230
Tyre Changer (manual)	4	150
Tyre Changer (auto)	6	150
Sand Blast Cabinet	10-50	50-100
Sand Blast Hand Gun	8-12	100
Spray Guns		
airbrush	0.25	30
miniature	4-7	20-50
low pressure	1.5-4	20-40
standard	7-14	50-60
HVLP	14-20	70-90
HA/GEO/9000 series LVLP	7-9.5	28-36
Air Fed Mask	5-6	20-40
Oil Pump	1.5	100-150
Grease Pump	4.5	100-150
Air Water Wash	10	150
Car Wash	1.5-5	70-100
Blow Gun (safety nozzle)	3	100
Spark Plug Cleaner	3	100
Underseal Gun	4	100
Rivet Gun	1.5-3	70-90
2 Ton Air/Hydraulic Lift	5-8	130-150
Brake Tester	3-7	75-100
Plasma Cutter	6-8	60-100



Note:

The figures in the Air Equipment Consumption Table are only a guide., for additional information please check the tools/equipment's specification data.

Choosing the Right Compressor

Three-phase compressors are more efficient producers of compressed air than single-phase equivalent units, so where a three-phase supply is available the best option is the three-phase compressor. **Single-phase** compressors up to 2.5 hp can operate from a 240V 13 Amp power supply, with the exception of the new 3.0 HP Low Current models.

3.0 hp and above must operate from a 240V 30 Amp supply. Wherever possible choose a larger compressor than you require at present to allow for expansion. Compressors with cast iron cylinders running slow, offer a much extended service life.

- 1) Bodyshop - using the air equipment consumption guide, add all the equipment consumptions together and divide by two, the resulting figure is the minimum free air you require.
- 2) Workshop - using the air equipment consumption guide, add all the equipment consumptions together and divide by three, the resulting figure is the minimum free air you require.

Note: For calculation purposes always use free air delivered figures.

Compressor Size Guide

- A) Ask Questions like:
 - 1 What is the air to be used for?
 - 2 What is the maximum pressure required? (see consumption guide)
 - 3 What electricity supply is available? (single/three phase)
 - 4 What size compressor is currently in use? (see quick calculation guide below)
 - 5 How well does existing compressor cope?
 - 6 What are the future plans for additional staff and equipment?
- B) Complete Following List
 - 1 Number of tools and type
 - 2 Number of users
 - 3 Air consumption of largest tool/equipment using air
- C) Complete Survey Form
- D) Select Compressor from Catalogue (use only free air figures)

The Cost of Air Leaks to a business.

Hissing Sid is at work in most companies you visit. Hissing Sid is a length of air hose which has become the family 'air' loom, it must be, because this hose is costing its owner a small fortune and yet to suggest replacement would be a cardinal sin.

So what does Hissing Sid cost to run???

Air leak size	CFM lost	Energy
0.75mm dia.	1.6	300W
1.5mm dia.	6.5	1100W

Cost

A typical garage working a 7 day week (service station) multiplied by 365 days - = 1,365,000 cubic feet per year!!!

= 6,205kW per year!!!

= £550.00 per year!!!

Clearly a replacement hose and couplings makes economic sense.



Correct Hose Selection

An air tool needs the following:

- A) Correct size of compressor to ensure sufficient air available.
- B) Correct size of air hose to ensure minimal pressure drop and air flow
- C) Correct pressure at tool (see chart)
- D) Correct type of lubricant (NOT engine oil)
- E) CLEAN DRY AIR!!! (use filters, regulator, dryer and lubricant)

Recommended Air Hose Sizes

Hose	Uses	Max flow CFM
1/4"	Tyre inflators Airbrush Std spray guns 3/8"mm drill	5
5/16"	Ratchet wrench HVLP/LVLP spray guns 1/2" & 3/4" wrenches	15
3/8"	Sanders 25 1" impact wrenches	50



Always keep hose length as short as practical. eg. 1/2" impact wrench with 20 metres of 1/4" bore hose will develop less than 40% of its available power!!!

Where Did The Pressure Go?

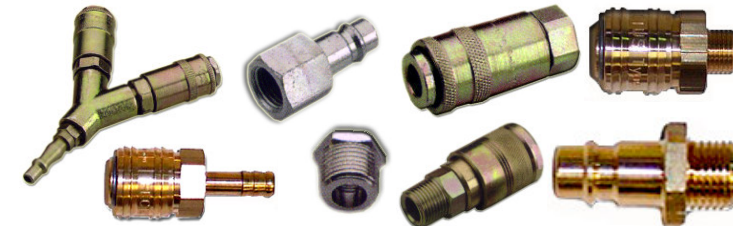
Pressure Drop

A 10 metre length of air hose flowing 15 cfm at 100 psi. g will lose the following pressure:

1/4"	bore loses	30 psi. g
5/16"	bore loses	12 psi. g
1/2"	bore loses	1 psi. g



Change your leaking fittings!



Movac stock 6mm & 8mm Air line fittings.

Movac stock 6mm & 8mm Air Lines

Movac stock 8mm Stoflex Hi Temperature Airlines for Spray Booths

Movac stock a wide range of Air tools and equipment.

Movac stock compressors