Thorite
AIR · FLUID · POWER · PERFORMANCE

A TECHNICAL GUIDE

AIR COMPRESSOR SELECTION

A comprehensive guide to assist users in selecting the correct workshop air compressor by providing an understanding of how to apply theory to air consumption calculations based on your specific requirements.



www.thorite.co.uk
enquiries@thorite.co.uk
0800 034 5850

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SELECTING A WORKSHOP AIR COMPRESSOR

What do I need to know?

Displacement (Volume / CFM)

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 the required compressor, as it bears no relationship to the free air figure that you may require.

Free Air Delivered (FAD)

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 (PSI / BAR)

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.



POWER SUPPLY

01

SINGLE PHASE

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

Main Benefit : Excellent second-hand resale value

5 Amp Light Circuit	Not suitable for equipment Max
13 Amp Ring Main	Compressor Max 3.0
45 Amp Cooker/Shower	HP compressor 3.5 - 4.00 HP

03

THREE PHASE

Main electrical supply to industry.

380/440 Volts.

Main Benefit : Approx 2/3 cost saving over single phase
Stable supply / Longer motor life

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.





COMPRESSOR SIZE GUIDE

To help you choose the correct air compressor, answer the questions below using the Air Tool Consumption Guide (page 5) and the Quick Calculation Guide below.

If you require any further assistance please contact one of our experienced technical specialists at any one of our branches.

BODYSHOP	VS	WORKSHOP
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.		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.

Quick guide to approx CFM/FAD output of 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

Part 1

1. What is the air to be used for?
2. What is the maximum pressure required? (see consumption guide, pg5)
3. What electricity supply is available? (single/three phase)
4. What size compressor is currently in use? (see quick calculation guide above)
5. How well does your existing compressor cope?
6. What are the future plans for additional staff and equipment?

Part 2

1. Dertermin the types and number of tools needed.
2. Calculate the number of users.
3. Establish the air consumption of your largest tool/equipment using air.
4. Select compressor from our website (use only free air figures / FAD)

AIRTOOL CONSUMPTION GUIDE

TOOL	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" Impact wrench	2-5	70-90
1/2" Rachet 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
Sandblast cabinet	10-50	50-100
Sandblast hand gun	8-12	100

TOOL	FAD/CFM	Pressure PSI.G
Sprayguns		
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
Miscellaneous Equipment		
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

Recommended Air Hose Sizes

HOSE	USES	MAX FLOW CFM
1/4"	Tyre Inflators /Airbrush	5
5/16"	Standard Spray Guns 3/8" Drill / Ratchet Wrench	15
3/8"	HVLP / LVLP Spray Guns (1/2" & 3/4") Wrenches / Sanders	25
1/2"	1" Impact Wrenches	50

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

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)

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thorite.co.uk



0800 092 1273

Branches

BOLTON
Raikes Lane Industrial Estate,
Bolton, BL3 2NH
Tel: 01204 362614
Email bolton@thorite.co.uk

BRISTOL
Unit 14, The Hemingway Centre
Walker Way, Thornbury, Bristol, BS35 3US
Tel: 0117 244 8609
Email: bristol@thorite.co.uk

SHEFFIELD
5 Bamforth Street,
Sheffield, S6 2HD
Tel: 0114 233 1128
Email: sheffield@thorite.co.uk

BRADFORD
Thorite House, Hillam Road,
Bradford, BD2 1QN
Tel: 01274 663471
Email: bradford@thorite.co.uk

LEEDS
Unit 4, Riverside Place, Bridgewater Road,
South Accommodation Road, Leeds, LS9 0RQ
Tel: 0113 200 0640
Email: leeds@thorite.co.uk

BRIERLEY HILL
Unit 31, Enterprise Trading Estate,
Pedmore Road, Brierley Hill, DY5 1TX
Tel: 01384 880850
Email: brierleyhill@thorite.co.uk

NORTH SHIELDS
Unit 4, Saturn Court,
Orion Business Park, North Tyneside, NE29 7BY
Tel: 0191 258 2623
Email: northshields@thorite.co.uk