
The Opcon Autorotor Twin Screw Compressor

THE TWIN SCREW COMPRESSOR OPENS UP NEW WAYS



1 Supercharging combustion engines

Perform better, consume less fuel

By supercharging with Autorotor Twin Screw Compressor you can get high charging pressure and thus increased engine torque and power giving a better performance over the whole speed range.

A small engine is more efficient than an engine with larger displacement when working at the same part load level. By supercharging, the max power output is maintained with the small engine.

By using our Twin Screw Compressor on a "down-sized" engine the overall fuel consumption can be reduced by 25-30%.

The Autorotor Twin Screw Compressors are available for internal combustion engines with a displacement of 0.5-10 litres (30 to 600 cu.i.).

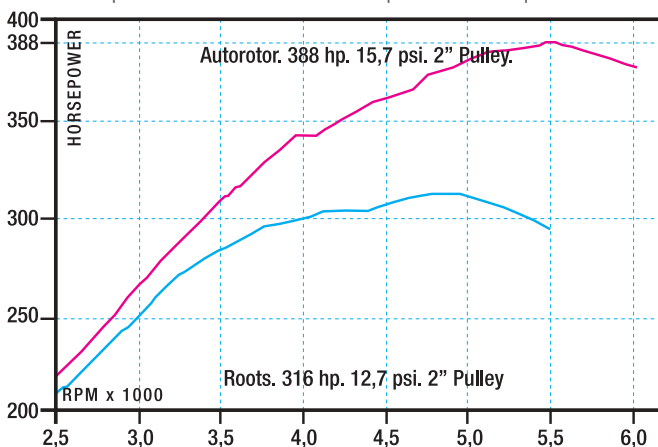


A Twin Screw Compressor vs. a Roots blower

A Twin Screw Compressor and a Roots blower were tested on the same vehicle during identical conditions. The test was performed by Kenne Bell, Muscle Mustangs and Fast Fords Magazine.

The diagram shows that the Twin Screw Compressor is more efficient than the Roots blower over the whole speed range.

Example: At an engine speed of 5500 rpm the Twin Screw Compressor develops 388 hp while the Roots blower reaches 316 hp. The difference is 72 hp in favor of the Twin Screw Compressor under equal conditions.

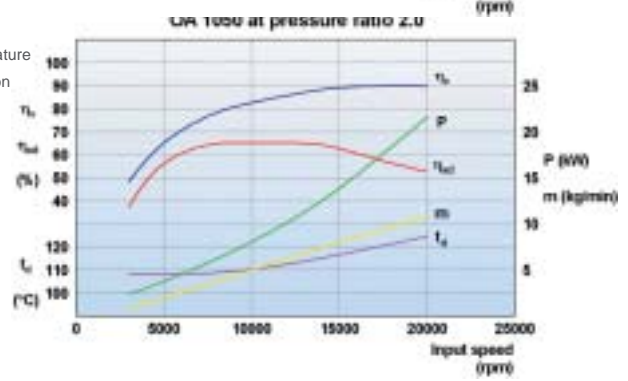
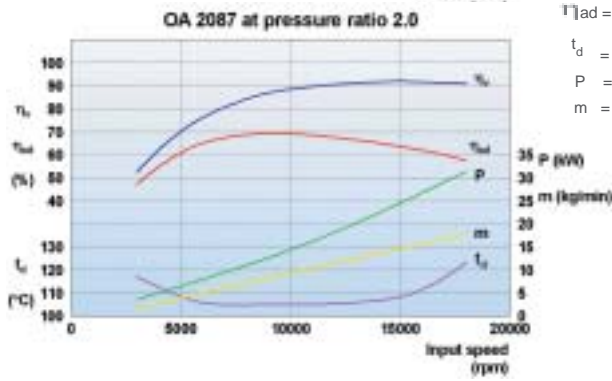
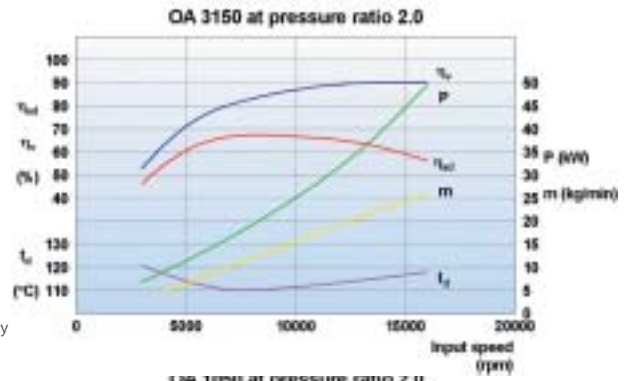
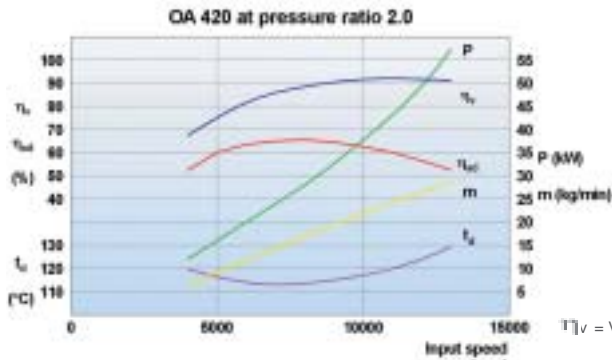


The Autorotor Twin Screw Compressor:
The unique Autorotor Twin Screw Compressor works with an internal compression giving high performance.

Due to the unique Autorotor Twin Screw rotor profiles, the air leakage is decreased and a lower discharge temperature is achieved. This contributes to minimize the driving power.

The Twin Screw Compressor has basically only two moving parts, the rotors. They do not touch each other and thereby is the air free from contamination.

The compressors are available in different sizes, with different displacements and built-in pressure ratios. For examples, see tables above right.



η_{ad} = Volumetric efficiency
 $\eta_{ad} = \frac{\text{adiabatic power}}{\text{input shaft power}}$
 t_d = Discharge temperature
 P = Power consumption
 m = Mass flow

| Compressor Type | MINIMUM CAPACITY | | | | | MAXIMUM CAPACITY | | | | |
|-----------------|------------------|------------------------|----------------------|----------|---------|------------------|------------------------|----------------------|----------|---------|
| | Litre/sec | m ³ /minute | m ³ /hour | g/second | kg/hour | Litre/sec | m ³ /minute | m ³ /hour | g/second | kg/hour |
| OA 0005 | 3,7 | 0,22 | 13,2 | 4,4 | 15,8 | 27,0 | 1,6 | 96,0 | 32,0 | 115,0 |
| OA 1032 | 9,0 | 0,54 | 33,0 | 10,8 | 39,0 | 86,0 | 5,2 | 312,0 | 103,0 | 375,0 |
| OA 1040 | 9,0 | 0,54 | 33,0 | 10,8 | 39,0 | 107,0 | 6,4 | 384,0 | 128,0 | 460,0 |
| OA 1050 | 9,0 | 0,54 | 33,0 | 10,8 | 39,0 | 133,0 | 8,0 | 480,0 | 160,0 | 576,0 |
| OA 2076 | 13,0 | 0,77 | 46,0 | 15,4 | 55,0 | 175,0 | 10,5 | 630,0 | 210,0 | 756,0 |
| OA 2087 | 14,0 | 0,82 | 49,0 | 16,4 | 59,0 | 205,0 | 12,3 | 737,0 | 245,0 | 884,0 |
| OA 3133 | 19,0 | 1,14 | 68,5 | 23,0 | 82,0 | 265,0 | 15,6 | 954,0 | 318,0 | 1145,0 |
| OA 3150 | 22,0 | 1,32 | 79,0 | 26,4 | 95,0 | 293,0 | 17,6 | 1053,0 | 351,0 | 1264,0 |
| OA 417 MX | 27,3 | 1,64 | 98,3 | 32,8 | 118,0 | 339,0 | 20,3 | 1218,0 | 406,0 | 1462,0 |
| OA 420 MX | 32,8 | 1,97 | 118,0 | 39,3 | 141,6 | 399,0 | 23,9 | 1434,0 | 478,0 | 1721,0 |
| OA 422 MX | 41,7 | 2,50 | 150,0 | 50,0 | 180,0 | 438,0 | 26,3 | 1578,0 | 526,0 | 1894,0 |
| OA 424 MX | 40,3 | 2,42 | 145,0 | 48,4 | 174,0 | 492,0 | 29,5 | 1770,0 | 590,0 | 2124,0 |

Capacity range of Autorotor Twin Screw Compressors, size OA 0005 to OA 424 MX, considering MIN capacity at $\eta_{ad} = 35\%$ and MAX capacity at maximum continues speed at pressure ratio = 2 and suction temperature = 20° C.



2 Supplying fuel cells with air

Air systems for a cleaner future

The fuel cells produce energy directly from hydrogen and emit only water.

Our high precision Twin Screw Compressors supply the cells with pressurised air resulting in better use of the hydrogen and higher efficiency.

The automotive industry all over the world is investing in the development of fuel cells as an alternative to the internal combustion engines. Pressurised air systems are used in most vehicle applications.

For more than 10 years we have been developing and supplying air systems for hydrogen fuel cells, including the Twin Screw Compressor and Expanders.

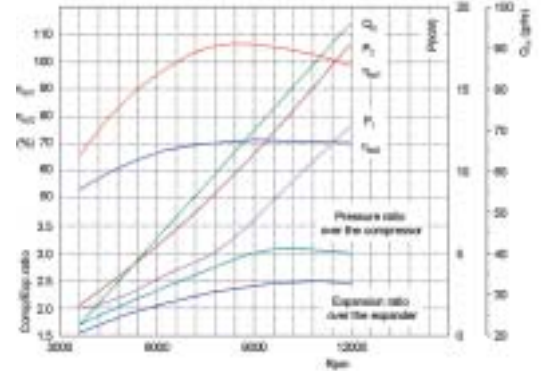
We design and deliver air systems with our highly efficient electric motor integrated to the compressor.

Save power, add an expander

By adding the expander, 30-35% of the input power can be recovered and assist the motor to drive. The power used for pressuring air is considerably reduced! Compare P_1 and P_2 in the diagram below.

Test of a Compressor-Expander-Unit:

P_1 = Power consumption expander connected
 P_2 = Power consumption expander disconnected





A Ballard fuel cell bus, equipped with our Twin Screw Compressor...



... just like a Ford internal combustion engine.

Opcon Autorotor AB Twin Screw Compressors and Expanders

Opcon Autorotor AB manufactures Twin Screw Compressors and Expanders used for fuel cell engines and internal combustion engines.

We, Opcon Autorotor AB, are the world leader in our fields. During 10 years we have delivered air systems to a majority of the world's fuel cell projects.



Opcon Autorotor is a Swedish company with head office in Saltsjö-Boo outside Stockholm. We are a member of the Opcon Group consisting of four companies manufacturing advanced products for the automotive industry. The Opcon Group has a subsidiary in Connecticut, USA.

Expand your possibilities, contact us today!



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