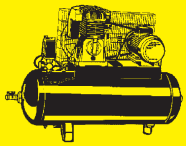
Compressed air in general



Single and double-stage compressors.
The single stage compressor is the most common for e.g. paint spraying, cleaning, inflating and to drive pneumatic tools. Double stage compressors are needed when the requisite pressure exceeds 8 bar. For, example when inflating large tyres for trucks.

Compressor pressure
is stated in the units bar and kPa for all compression sizes.

Displacement cylinder volume
is the theoretical performance received through the equation: piston number x piston area x stroke length x speed and is stated in l/sec, l/min or m^3/min.

Free air displacement
is the compressor's true capacity measurement and states what the compressor really delivers in air volume. This is stated in l/sec or l/min. The stated air volume is for Luna's compressors measured at 600 kPa (6 bar).
Degree of efficiency = Free air displacement in relation to the displacement cylinder volume.
NOTE. Differentiate between free air displacement and displacement cylinder volume.
Mixing up the expressions can be fatal when selecting a compressor, as the free air displacement is approximately 65% of the displacement cylinder volume for a 1-stage compressor and 75% for 2-stage compressors.

Load rate.
The reciprocating compressor's load rate is approximately 70%, which means that the reciprocating compressor must not be operational more than 70% of the working time. Accordingly, the compressor must load up the working operations and rest while the pressure drops to the set lower pressure. A screw compressor's load rate is 100%.

Screw compressor
The screw compressor is mainly intended for air requirements above 1 m^3/min and is easier to install than a reciprocating compressor, as well as having fewer moving parts and with lower demands on service and maintenance. It is also easier to integrate in the complete air treatment system (refrigerant type dryer, filter and heat recovery).

Valve relief operation
The motor is continuously in operation and the compressor "idles" i.e. is offloaded between compression intervals. Pure ventilating units must be manually offloaded with start against pressure.

Fully automatic operation.
Fully automatic operation applies to compressor units with electric motors for direct start up to 4 kW (5.5 hp). A push-bar switch breaks and makes the motor and stops and starts the compressor at the upper and lower pressure limits.

Combined electropneumatic automatic operating systems
for fully automatic operation with delayed stop or valve relief operation. Generally used on compressor units with YD-started motors i.e. from 5.5 kW (7.5 hp) and upwards.

Choice of one or more screw compressors.
The compressed air is for many just as important as electricity. A goal should be 2 + 1 compressors, i.e. two that are operation and controlled automatically according to the frequently varying air consumption and one compressor in reserve. This solution gives operating reliability, good operating economy and a reasonable investment rate.

Dimensioning a compressor installation.
Select a sufficiently large and reliable compressor installation to prevent heat and condensation problems. Calculate the net air consumption bearing in mind the utilisation rate, pressure drop, leakage, wear, etc. Remember future requirements, choose a compressor with a capacity equal to double the net consumption for a day.

Designing the compressor room.
The room should be sufficient to facilitate maintenance, service and expansion. Good ventilation is extremely important. Also consult the manufacturer or supplier with regard to the design and dimensioning of the compressed air network.

Utilisation rate for compressed air machines.
Due to practical reasons, some compressed air machines cannot be used continuously. The utilisation rate for the most common compressed air machines based on experience is stated below. These values can be used when calculating the demanded compressed air capacity.

Grinding machines	50% utilisation rate
Drilling machines	40% utilisation rate
Pneumatic chisel	30% utilisation rate
Impact wrenches	10% utilisation rate
Blowguns	10% utilisation rate