Installing your air motor

Airlines

The recommended dimensions of airlines is given in the introductory section to each motor type. Note that exhaust hose is larger than the inlet hose.

The recommendations are valid for hose lengths of up to 3 metres. For distances between 3 and 15 metres select a hose diameter one size up, and for distances between 15 and 50 metres select a hose diameter two sizes up.

It is important to note that the output of the motor will be reduced if these guidelines are not followed.

Recommended hose connectors

Because of the compact dimensions of the Atlas Copco vane motors, special hose connectors are available with small key width – facilitating easy installation. Table 8.

The connectors below can be ordered through your local Atlas Copco representative.

Air preparation

To ensure reliable service an air filter and lubricator should be fitted into the inlet airline – within 5 metres from the motor.

It is recommended that a pressure regulator is also incorporated into the air preparation package. This has the function of maintaining the desired working pressure, and can be used to modify the motor’s output to meet the needs of the application.

When selecting an air preparation package, ensure all components have a flow capacity sufficient to meet the requirements of the motor. A typical arrangement of an air preparation installation is shown below, Figure 9.

Lubrication

Atlas Copco air motors LZB 14, 22 and LZB 33/34 are available as standard in lubricated free versions. To achieve optimum service life and performance of the lubricated airmotors they should be supplied with 50 mm3 of oil for each cubic metre (1000 litres) of air consumed (1 drop = 15 mm3).

Insufficient lubrication will result in accelerated vane wear and a reduction in performance.

The following example shows how to calculate the lubrication required by a motor running at a known output.

Example:

A non-reversible LZB 42 motor running at maximum output consumes 13 litres/sec of air.
In one minute it consumes 780 litres of air, therefore the lubrication required is:

\[
\frac{780 \times 50}{1000} = 39 \text{ mm}^3/\text{min}
\]

If an oil-fog lubricator was to be used it should be set to deliver 3 drops of oil a minute (1 drop = 15 mm3).

The lubrication oil selected should have a viscosity which lies between 50 and 300 x 106 m2/s at the motor’s working temperature.

However, if it is necessary to reduce the level of oil exhaust from the motor, and a piped-away or filtered exhaust is not acceptable, then the lubrication level can be reduced.

Although this will effect the motor, the performance may still be acceptable. Table 9 shows how reduced lubrication can affect service life and output.

It is also possible to fit lubrication free vanes to other air motors than LZB 14, 22 and LZB 33. However, that is only suitable under certain conditions. Check with your local Atlas Copco representative if you require further information.

If the supply air is very dry the idling speed of the lubrication free motors may degrade somewhat after running for longer periods, a decrease of 10–15% may be noticeable. The power of the motors is, however, generally not affected. To guarantee longer service intervals the lubricated, standard motors are still the best choice.

<table>
<thead>
<tr>
<th>Thread in (in)</th>
<th>Hose size (mm)</th>
<th>Ordering No.</th>
<th>Thread in (in)</th>
<th>Hose size (mm)</th>
<th>Ordering No.</th>
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<td>1/8 BSF</td>
<td>3.2 / 1/8</td>
<td>9000 0523 00</td>
<td>3/8 BSPT</td>
<td>10.3 / 3/8</td>
<td>9000 0242 00</td>
</tr>
<tr>
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<td>5.0 / 3/16</td>
<td>4010 0601 00</td>
<td>3/8 BSPT</td>
<td>12.5 / 1/2</td>
<td>9000 0248 00</td>
</tr>
<tr>
<td>1/8 BSPT</td>
<td>6.3 / 1/4</td>
<td>9000 0240 00</td>
<td>1/2 BSPT</td>
<td>12.5 / 1/2</td>
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<td>9000 0625 00</td>
<td>1/2 BSPT</td>
<td>16.0 / 5/8</td>
<td>9000 0242 00</td>
</tr>
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<td>9000 0241 00</td>
<td>1/2 BSPT</td>
<td>20.0 / 3/4</td>
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<td>20.0 / 3/4</td>
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<td>10.0 / 3/8</td>
<td>9000 0247 00</td>
<td>1 BSPT</td>
<td>25.0 / 1</td>
<td>9000 0246 00</td>
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<td></td>
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</tr>
<tr>
<td>Thread in (in)</td>
<td>Hose size (mm)</td>
<td>Ordering No.</td>
<td>Thread in (in)</td>
<td>Hose size (mm)</td>
<td>Ordering No.</td>
</tr>
</tbody>
</table>

Table 8

Table 9
**Directional control valves**

These valves are used to start or stop a motor, or to change its direction of rotation. It is most usual to use what is termed a 5/3 valve to control a reversible motor, and a 3/2 valve to control a non-reversible motor.

The valve designations refer to the number of connection ports and the number of operating positions the valve provides, for a 5/3 valve this is 5-connection port and 3 positions. When selecting any control valve it is important to ensure that it has a flow capacity that is sufficient to supply the requirements of the motor.

**Installations examples**

Typical installation diagrams for type LZB and LZL air motors, together with their associated control valves, filters, regulators lubricators and silencers.

**LZB Circuits**

The symbols used to represent these valves in an installation diagram.

The direction of rotation is controlled manually by a lever-operated 5/3 valve. The air preparation unit ensures that the motor is supplied with clean air and lubrication. The built-in pressure regulator can also be used to modify the output of the motor.
For LZL air motors it is important that an inlet restrictor is placed upstream the inlet. It must be placed so it does not affect the exhaust at reversible running. This means that it has to be placed before the control valve.

**LZL Circuits**

**Non-Reversible duty**
with 3/2 valve

**Reversible duty**
with 5/3 valve and closed mid position

**Reversible duty**
with 5/3 valve and open mid position

A = Filter  
B = Pressure regulator  
C = Oil fog lubricator  
D = Silencer  
E = 5/3 valve  
F = Air motor  
G = 3/2 valve

1 = Inlet restrictor  
2 = Outlet restrictor