The air-air pressure multiplier, or booster, is an automatic device that compresses air to give an outlet pressure that is two or four times greater than the inlet pressure. It is normally used to locally intensify the input pressure of one or more actuators. As it is entirely pneumatic, it can be used when electric devices are not recommended. The novelty is that the booster has built-in non-return valves that maintain the outlet pressure even when the supply of compressed air is cut off. This means it is necessary to interrupt the supply and relieve the circuit before doing anything to the device. It is advisable to install a tank after the booster to prevent fluctuations in outlet pressure.

**APPLICATIONS**

Air-air boosters are used for instance in seal or burst tests, or to increase power in cylinders to avoid having to replace them with ones with a larger diameter.

**RECOMMENDED CIRCUIT**

1. Air-air booster
2. Tank
3. Pressure regulator
4. Pressure regulator
5. FRL unit

To achieve the correct booster pressure ratio, regulators 3 and 4 must have the same pressure.
COMPONENTS

1. FRONT CYLINDER HEAD: 2011 neutral anodised aluminium
2. FRONT LINING: Ø50/Ø63 profiled anodised aluminium
3. INTERMEDIATE CYLINDER HEAD: 2011 neutral anodised aluminium
4. REAR LINING: Ø100 profiled anodised aluminium
5. SILENCER: nickel-plated brass
6. BOLT: white galvanised steel
7. REAR CYLINDER HEAD: 2011 neutral anodised aluminium
8. EXCHANGER PISTON: brass
9. EXCHANGER GASKET: NBR rubber
10. PISTON GASKET: NBR rubber
11. GUIDE BANDS: phenolic resin
12. PISTON Ø50/Ø63: 2011 aluminium
13. PISTON ROD Ø16: C45 ground chrome steel
14. FILTER: sintered bronze
15. PISTON GASKET Ø100: NBR OR compound and plastoferrite band
16. PISTON Ø100: 2011 aluminium
17. VNR RING NUT: nickel-plated brass
18. VNR SPRING: stainless steel
19. VNR PISTON: brass
20. VNR SOLID GASKET: CSC polyurethane
AIR-AIR PRESSURE MULTIPLIER
(BOOSTER) – SERIES 08

DIMENSIONS

**ZS208100500400**

G1/8 = air inlet 1
G1/4* = air inlet 2
G1/4° = Boosted air outlet

**ZS208100630400**

G1/8 = air inlet 1
G1/4* = air inlet 2
G1/4° = Boosted air outlet
# AIR-AIR PRESSURE MULTIPLIER (BOOSTER) – SERIES 08

## TECHNICAL DATA

<table>
<thead>
<tr>
<th></th>
<th>Z5208100500400</th>
<th>Z5208100630400</th>
</tr>
</thead>
<tbody>
<tr>
<td>Chamber 1 bore</td>
<td>100</td>
<td>100</td>
</tr>
<tr>
<td>Chamber 2 bore</td>
<td>50</td>
<td>63</td>
</tr>
<tr>
<td>Compression ratio</td>
<td>4:1</td>
<td>2.5:1</td>
</tr>
<tr>
<td>Inlet pressure</td>
<td>2-8</td>
<td>2-8</td>
</tr>
<tr>
<td>Noise level</td>
<td>90</td>
<td>89</td>
</tr>
<tr>
<td>Operating temperature</td>
<td>-10° to +60°</td>
<td>-10° to +60°</td>
</tr>
<tr>
<td>Fluid</td>
<td>Filtered lubricated or un lubricated air</td>
<td>Lubrication, if used, must be continuous</td>
</tr>
</tbody>
</table>

## KEY TO CODING

<table>
<thead>
<tr>
<th></th>
<th>Z52</th>
<th>08</th>
<th>100</th>
<th>50</th>
<th>04</th>
<th>01</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>SERIES</td>
<td>CHAMBER 1 BORE</td>
<td>CHAMBER 2 BORE</td>
<td>STROKE (CM)</td>
<td>RETURN</td>
<td></td>
</tr>
<tr>
<td></td>
<td>08</td>
<td>100</td>
<td>50</td>
<td>63</td>
<td>04</td>
<td>00</td>
</tr>
</tbody>
</table>

00 STANDARD
01 WITH REGUL
02 WITH 2 REGUL

The difference between the pneumatic chamber 1 and pneumatic chamber 2 determines the booster multiplication ratio.
The graphs below refer to the filling of a 10-litre tank and show the pressure increase ratio $P_2:P_1$ as a function of time (sec).

When calculating the tank filling time, the ratio $P_2:P_1$ must have 2 values. The first value is the ratio of the initial tank pressure “$P_i$” to the booster supply pressure “$P_a$”; the second value is the ratio of the final tank pressure “$P_f$” to the supply pressure “$P_a$”.

The data required to calculate the tank filling time are thus:

- $P_a$ = air-air booster supply pressure
- $P_i$ = Initial pressure in the tank
- $P_f$ = Final pressure in the tank
- $V$ = Volume of the tank
EXAMPLE OF CALCULATION

Let us assume we need to fill a 50-litre tank with our booster ratio 4:1 (Z5208100500400) at a pressure of 5 bar. The tank has an initial pressure of 6 bar, which needs to be increased to 15 bar.

In short,

\[
\begin{align*}
Pa &= 5 \text{ bar} \\
Pi &= 6 \text{ bar} \\
Pf &= 15 \text{ bar} \\
V &= 50 \text{ litres}
\end{align*}
\]

Now let us calculate the initial and final ratios \(P_2:P_1\).

\[
\begin{align*}
P_2:P_1(i) &= Pi:Pa = 6/5 = 1.2 \\
P_2:P_1(f) &= Pf:Pa = 15/5 = 3
\end{align*}
\]

Now let us go to the relevant booster graph and read the time value in relation to the pressure ratios we have just calculated.

With \(P_2:P_1(i)\), time \(T_i = 15\) sec.

With \(P_2:P_1(f)\), time \(T_f = 130\) sec.

The difference between the final time and the initial time gives the value \(T\) to be inserted in the final formula:

\[
T = T_f - T_i = 130 - 15 = 115 \text{ sec.}
\]

The filling time \(T_r\) for a 50-litre tank will be:

\[
T_r = T \times V / 10 = 115 \times 50 / 10 = 575 \text{ sec.}
\]
AIR-AIR PRESSURE MULTIPLIER
(BOOSTER) – SERIES 08

FLOW RATE CHARTS

Z5208100500400

Z5208100630400
AIR-AIR PRESSURE MULTIPLIER (BOOSTER) – SERIES 08

SET OF SPARE GASKETS

<table>
<thead>
<tr>
<th>No.</th>
<th>Z5208K50100</th>
<th>Z5208K63100</th>
<th>Material</th>
<th>Q.ty</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>C1011300</td>
<td>C1011300</td>
<td>NBR</td>
<td>1</td>
</tr>
<tr>
<td>2</td>
<td>C1016200</td>
<td>C1019300</td>
<td>NBR</td>
<td>1</td>
</tr>
<tr>
<td>3</td>
<td>C1021100</td>
<td>C1021100</td>
<td>NBR</td>
<td>1</td>
</tr>
<tr>
<td>4</td>
<td>C1023300</td>
<td>C1023300</td>
<td>NBR</td>
<td>1</td>
</tr>
<tr>
<td>5</td>
<td>C1069705</td>
<td>C1069706</td>
<td>NBR</td>
<td>1</td>
</tr>
<tr>
<td>6</td>
<td>C1099891</td>
<td>C1099891</td>
<td>NBR + Plastof.</td>
<td>2</td>
</tr>
<tr>
<td>7</td>
<td>C1099952</td>
<td>C1099952</td>
<td>NBR</td>
<td>1</td>
</tr>
<tr>
<td>8</td>
<td>CAT50060009</td>
<td>CAT50060009</td>
<td>Polyurethane</td>
<td>1</td>
</tr>
<tr>
<td>9</td>
<td>CAT54540003</td>
<td>CAT54540003</td>
<td>Polyurethane</td>
<td>2</td>
</tr>
</tbody>
</table>

ACCESSORIES

The air-air booster is available with 1 or 2 regulators, complete with G1/8 or G1/4 male-male fittings, pressure gauge and 12 bar bit.